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TREATMENT OF FRACTURES OF THE SHAFT OF THE HUMERUS

BY

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AND

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Under the present system we have had the opportunity of seeing patients on whom primary reduction and fixation of a fractured shaft of humerus had been performed elsewhere. Many of these cases have had time and care spent on elaborate methods of fixation, with disappointing results. Commonly, some form of abduction splint or plaster has been used. We have also heard from individual surgeons, who express dissatisfaction with these and other popular methods of treatment.

The three-splint method, with collar-and-cuff sling, which will be described later, has given consistently good results for many years, and would appear to have considerable advantages over methods which employ the abducted position. Before describing the method and the principles which underlie its use it is interesting to review the more usual ways of treating the fractured shaft of the humerus.

Usual Methods of Fixation

Methods of fixation may be divided into two types: (1) abducted or semi-abducted positions, where gravity acts adversely on the position of the fragments; (2) arm-by-the-side positions, where the force of gravity assists in reduction and in maintaining position.

Abducted or Semi-abducted Positions

The shoulder spica, abduction frame, and Thomas arm-splint all fall into the first group. The shoulder spica is not easy to apply while maintaining accurate reduction of the fracture. It does not always hold reduction when applied for an oblique fracture, and it is unnecessarily inconvenient for the patient and surgeon when simpler methods are as efficacious.

The abduction frame requires constant attention, and should it slip or sag considerable displacement of the fracture will occur. In the case of oblique fractures skin traction is not to be relied upon, and skeletal traction, by means of a pin or wire through the olecranon, is often used with the abduction frame. Such traction has been shown to cause non-union and, if a pin is employed, elbow stiffness or worse. It is hard, under any circumstances, to justify skeletal traction in the treatment of a fresh fracture of the humeral shaft.

The Thomas arm-splint requires recumbency, which of itself is a disadvantage. With this splint traction must be used, and may lead to non-union or malalignment if the carrying angle is not watched carefully.

All of the above methods may give excellent results under the care of the individual surgeon, but in present circumstances, when evacuation of casualties is often essential, they are cumbersome and frequently fail to hold the fragments in a reasonably good position. The Thomas arm-splint is especially difficult to manage in transport, as the arm must stick out at right angles to the patient.

Arm-by-the-side Positions

Arm-by-the-side methods, where advantage is taken of the force of gravity, include the hanging cast, the U-shaped plaster slab and sling or collar and cuff, and the three-splint method with collar-and-cuff sling.

Use of the extension hanging cast is discouraged for two reasons—its very weight may succeed in producing non-union, and there is less immobilization in a hanging cast, which extends only to the axilla, than in a simple sling. Constant rotary and lateral strain must occur at the fracture site.

The U-shaped slab of plaster, extending from the axilla over the elbow and on to the shoulder, has a superficial resemblance to the three-splint method, but differs in two respects. The slab of plaster is usually closely moulded round the arm without padding, and the ultimate alignment of the humerus is determined the moment the plaster hardens. Metal splints can never be in such intimate contact with the arm, but, being straight, they encourage the normal straightness of the humeral shaft during healing of the fracture. The other essential difference is the support afforded by the continuation of the plaster around the elbow. The amount of support obviously varies with the firmness of the bandage round the upper arm, but in many cases where the bandage is reapplied at intervals it is thought to be considerable.

Three-splint Method

Figs. 1 and 2 illustrate two cases of fracture of the humerus treated by the three-splint method. The materials required

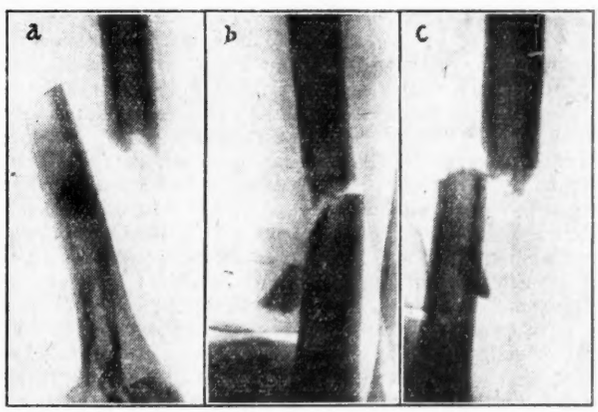

FIG. 1a.—Fracture of shaft of humerus five weeks after injury. Position on admission in Thomas arm-splint. Two unsuccessful attempts at reduction had been made, using an arm plaster to the axilla and a thoraco-brachial cast, before resorting to the Thomas arm-splint. FIGS. 1b and 1c.—Antero-posterior and lateral views of the same fracture a few days after adoption of the three-splint method. A grafting operation was necessary to secure union.

are: three metal gutter splints—approximate sizes, 3 in. by 20 in., 3 in. by 8 in., 2 in. by 5 in.; wool padding and adhesive strapping; two 6-in. calico bandages; collar-and-cuff sling. The splints may equally well be replaced by Cramer wire or plaster.

The splints are suitably padded and applied as in Fig. 3. It should be noted that the longer splint, on the lateral aspect, is twisted so as to lie away from the lateral epicondyle, and bent so as to lie over the acromion process. The splints are first fixed with two encircling bands of adhesive tape, and then

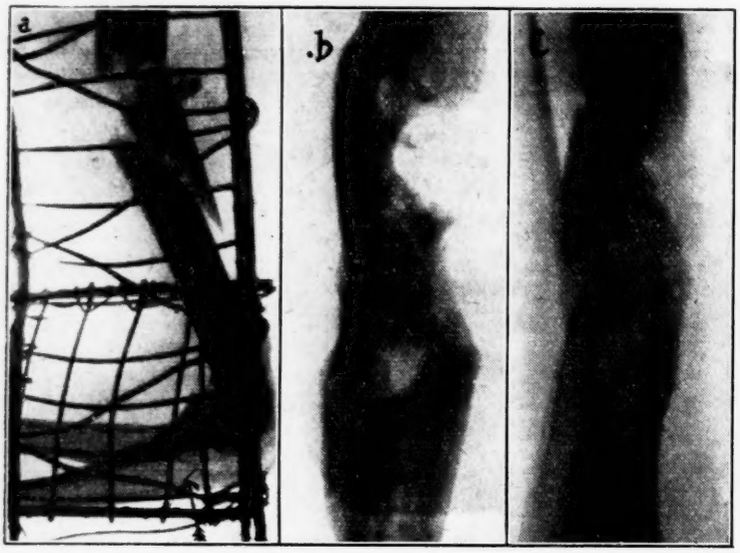

FIG. 2a.—Fractured shaft of humerus on Cramer wire abduction frame, with wire traction through the olecranon. Position on admission. FIGS. 2b and 2c.—Final result following immobilization with three splints and collar-and-cuff sling.

bandaged over. Finally, a bandage in the form of a shoulder spica is applied, and the wrist is suspended by the collar and cuff, with the elbow at right angles. On no account should an ordinary sling be used, as this prevents the weight of the arm from acting on the fracture. For the same reason care should be taken to see that the shirt or other garment is not so arranged as to have the effect of a sling. No special attempt at reduction is made beyond the correction of any gross deformity. The patient is not confined to bed, and for the first two weeks he should be well propped up at night so that the arm is constantly vertical. Radiographs taken immediately after the application of splints will probably be disappointing, but five days later excellent position will have been obtained in the vast majority.

Cause of Displacement at Site of Fracture.—Importance is usually attached to the deforming influence of the adductor and abductor muscles attached to the upper part of the humerus. In practice, using the three-splint method, this consideration has been found to be largely theoretical. The reason advanced to account for this finding is that muscle spasm, which can never be continuous for long, disappears as soon as the fracture is immobilized. Should the fracture receive a sudden jolt within the first few days, muscle spasm reappears with its deforming influence for a few minutes, but position is soon corrected by the continuous action of gravity. In the abducted position the arm is much more liable to receive many minor jolts, and any displacement which is caused thereby is not subject to the same corrective force which now acts at right angles to the humeral shaft. Mention must be made of the oblique or unstable fracture of the shaft of the humerus. This is the type of fracture that led to the use of active extension, which is not only unnecessary but dangerous. A successful result following on treatment in abduction with skeletal traction is a matter for congratulation; treated in three splints with a collar-and-cuff sling, it is a matter of course.

Compound Fractures.—The method described is equally suited to compound fractures. Following the usual primary excision, a wound pack may be covered with a few turns of elastic adhesive bandage before the splints are applied. Wound-healing has been just as satisfactory with this form of "no-dressing technique" as with the more usual plaster cast. An exception to the use of a collar-and-cuff sling may be made when a portion of the humerus has been completely shot away. Actual shortening should be encouraged by the use of an ordinary arm sling to avoid the occurrence of non-union.

Unreduced Fractures Several Days Old.—Inevitably, in the present war, we will be faced with fractures that have not received adequate surgical attention for some days. The shaft of the humerus, without other injuries to prevent the erect posture, will come to little harm in a sling, but if the patient is recumbent considerable angulation and shortening may occur. We have seen several such fractures, and reduction has been impossible without some form of traction. A 3-lb. weight, held immediately beneath the olecranon process in a few turns of plaster bandage, has been

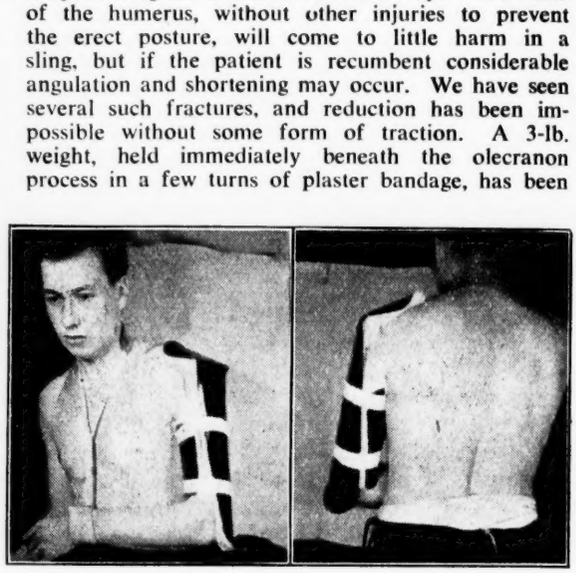

FIG. 3.—Front and back views of splinting for fractured shaft of humerus before application of bandage. Note method of bending the lateral splint.

very effective in obtaining full length in these cases. It should not be left in position longer than the two or three days necessary to obtain reduction.

Summary

An account of the three-splint method of treating fractures of the shaft of the humerus is given.

The success of this simple and well-tried method is considered worthy of rediscovery at the present time.

Other methods in vogue are compared unfavourably.

TUBERCULOSIS IN THE MERCHANT NAVY

BY

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Tuberculosis workers who deal largely with patients from a certain occupational group are naturally interested in the incidence of and mortality from the disease in that particular group. These figures, however, are generally difficult to obtain, and especially so in the case of the seafarer. Owing to the wide distribution of British seamen of the Merchant Navy, both afloat and ashore, there seems to be no way of obtaining actual incidence figures for the occupation as a whole, and only within the last decade or so have serious attempts been made to ascertain the mortality rate with reasonable accuracy.

At this critical time, when so much depends on the men of the Merchant Navy, closer attention has been drawn to the adverse conditions of their life. It is therefore appropriate to consider the prevalence of tuberculosis among them and discuss what steps can be taken to limit the number of victims. Proper incidence figures being unobtainable, investigations on the mortality rate are here briefly reviewed.

An annual return of deaths at sea is made by the Registrar-General of Shipping, but this of itself is insufficient, as it leaves out of consideration the much larger number of seamen ashore who are sick, are unemployed, or have left the sea entirely on account of sickness, age, or other reasons. As already

pointed out (Wood, 1928), the majority of those afflicted are likely to leave sea-going employment to obtain treatment ashore, and if treatment is of no avail their deaths would be recorded ashore. Thus the death rate afloat is of little use as an indication of the true mortality from the disease.

Statistical Investigations

In the Registrar-General's Decennial Supplement to his report on the Census of 1921, issued in 1927, an attempt was made to arrive at the mortality figure, and it was found that the death rate for all seamen afloat was nearly double the calculated rate. In view of this high figure the Board of Trade in 1929 initiated a further investigation for the period of 1929–30. This was carried out for the London School of Hygiene and Tropical Medicine by Major P. Granville Edge. The report of this investigation was published in 1932, and showed the many difficulties met with in the satisfactory determination of a population figure for seamen. This should be obtained from the Decennial Census of the general population —i.e., the number of seamen ashore—plus the annual returns of seamen at sea. Unfortunately the latest Census available at the time of this investigation was that of 1921. The population had therefore to be estimated, so the figures cannot be strictly accurate. Difficulty was also experienced in determining the number of deaths which could be properly attributed to service at sea among seamen as defined by the Board of Trade. But the deaths enumerated rightly included those of seamen at sea and ashore, both employed and unemployed.

In Table V of that report the death rate from respiratory tuberculosis among British seamen of all ages is given as 2.37 per 1,000, and in Table VIII the proportion of deaths from respiratory tuberculosis to total deaths is stated to be 9.5%. Even if these figures are only approximately correct, the mortality from this disease is obviously high. Of the deaths occurring within twelve months of leaving sea-going employment Fleet Surgeon Home (1934) found that 20% were due to tuberculosis.

It was not until the publication in 1938 of the Decennial Supplement to the 1931 Census that more definite information became available. The special section therein dealing with deaths among seamen is based on the Census returns for 1931 and the mortality figures for the 3 years 1930–2, to which are added the population afloat on the Census date and the deaths at sea or abroad for the corresponding years, obtained from the Registrar-General of Shipping. The returns have been adjusted to exclude fishermen, lascars, foreign seamen, and Irish Free State crews, whether ashore or afloat, and therefore apply to British seamen only. A slightly wider field of occupation is covered than that of the Board of Trade returns, but any possible variation due to this must be very small.

Table *c* of this report gives the number of deaths and the standardized mortality, analysed by cause and by age groups, and the following particulars are taken from it.

Registrar-General's Decennial Supplement to the 1931 Census.—Table c: Deaths and Standardized Mortality analysed by Cause

	No. of Deaths recorded in 1930–2 at Ages 20–65	Calculated Deaths, 20–65	Recorded per 100 calculated, 20–65
All causes	6,645	4,522	147
Violent causes	1,157	486	238
Tuberculosis (all forms)	1,231	830	148
Cancer	654	552	118
Diabetes	51	45	113
Cerebral haemorrhage	263	192	137
Heart diseases	861	674	128
Respiratory diseases	620	527	118
Gastric or duodenal ulcer	156	118	132

It will be seen that tuberculosis is the most frequent single cause of death for the total age group of 20 to 65. It is unfortunate that the figures for seamen refer to all forms of tuberculosis, for in all other occupations the deaths from respiratory tuberculosis are given apart from those of non-respiratory disease. Thus it is not possible to compare the figures for seamen with other occupations accurately.

In 1936 the M.O.H. for Cardiff, Dr. J. G. Wilson, published the tuberculosis mortality rate in the various districts of that city for the period 1923–34. He showed that the death rate in the docks area was 3.4 per 1,000—twice as high as in other areas. But the rate refers only to seamen ashore, and must necessarily be higher than for the whole population of seamen ashore and afloat; it refers also to deaths from all forms of tuberculosis. Moreover, the tuberculous population included twice as many lascars and foreign seamen as British, and the high figure quoted is therefore not comparable with either the Board of Trade investigation or the Decennial Supplement, from both of which lascars and foreign seamen are purposely excluded. Tuberculosis among lascars is, in fact, a serious question which cannot be dealt with in this short paper.

While these figures of mortality in seamen are meagre and must be accepted with some reserve owing to the many difficulties in arriving at a correct figure, there seems no doubt that the death rate from tuberculosis among British seamen is considerably higher than that of the general population; but not so high as in the silica occupations and others in which the mortality is known to be exceptionally heavy.

Condition of Patient and his Response to Treatment

There is another aspect of the problem, however, which is worth consideration—viz., the condition of the patient when he does at last come for treatment, and the nature of his response to treatment. The following table gives the classification on admission to this sanatorium of 300 British seamen almost direct from sea, and the immediate results of treatment.

Classification	Cases	Results of Treatment			
		Quiescent	Improved	No Material Improvement	Dead
Class A	24	9	9	5	1
Class B :					
Group 1	8	6	1	1	
Group 2	107	52	43	12	
Group 3	161	10	31	69	51

The proportion of B3 cases is 54%. Of this group 30% actually died in the sanatorium and 43% made no material improvement. Thus treatment proved useless in 73% of the advanced cases. These figures are worse than in most administrative areas ashore. In the County of Lancashire, for the year 1936, the proportion of B2 and B3 cases combined was only 55.8% of the total number of new cases (G. Lissant Cox, 1936).

Earlier Diagnosis

What can be done to stop this ghastly succession of deaths and appalling waste of man-power, of men so urgently needed to-day? All tuberculosis workers know the answer: it is, of course, earlier diagnosis and earlier treatment.

It would be easy to write at length on the various factors of life at sea which may lower resistance to tuberculosis or tend to spread the disease, but few of them can be rectified for a very long time yet. Chief of these factors is, in my opinion, the overcrowding in living and sleeping quarters which is almost universal. The cubic space allotted is definitely below the minimum allowed ashore, and bad weather generally means closing whatever ventilation may be provided. It is to be hoped that some improvement in this respect will be made in the ships now being built. Improved washing and sanitary facilities are badly needed in most ships, and improved arrangements should be made for sterilization of verminous and infected bedding.

But earlier diagnosis can and should be made. It may not be generally known that medical examination of crews is not required by law, with the exception of boys under 18 and crews of emigrant ships. Examination is, however, generally required by the shipping companies, mainly to safeguard themselves against compensation claims and against the expense of treatment in foreign ports, for which they are legally responsible. Even so, the examination is generally perfunctory. Shipping Federation doctors are paid 1s. a head for these examinations—hardly an inducement to careful work. Better medical examination is a matter for the Shipping Federation and senior medical officers of shipping companies to encourage, and no doubt much could be achieved in this way if only the importance of the matter were realized.

But is not this the very kind of community, where men of all ages are living in such close contact and where there is no lack of carriers, in which mass radiography (whether by miniature screen photography or otherwise) is essentially called for? Wherever carried out, this aid to early diagnosis has proved of immense service. Already our ex-Royal Navy patients are being admitted at a much earlier stage of disease than before routine radiography was undertaken. Practical difficulties in the way of such a scheme are obvious, but with the necessary good will they can be overcome. What cannot be achieved by official means can at least be started by voluntary effort, and I am glad to say that research in this direction is about to be made by the Seamen's Hospital Society. When the value of such examination can be demonstrated clearly, official recognition should follow and the seaman victim of tuberculosis have a brighter future.

The proportion of "pick-ups" (a horrible term which seems to have come to stay!) from miniature mass radiography as given by different workers in this country (Dudley, 1941; Galbraith, 1941; Clark, Poulsson, and Gage, 1941; Clark, 1942) varies from 0.3 to 1.6%. The population of British seamen afloat was stated by the Registrar-General of Shipping to be 89,000 in 1931. Taking the number to-day as a round 100,000 and the proportion of cases found with active tuberculosis as 1%, we should expect that eventually 1,000 men would be removed from active service when all the 100,000 had been examined. But the examinations could only be done gradually, and the loss of men would therefore be gradual also, whilst after a year or two the number of men found affected should be very much less.

It has been said that such a loss of personnel is not practicable in wartime. But if sources of infection are allowed to remain the eventual loss is likely to be higher still. Conditions at sea to-day are worse than ever. The likelihood of infection is greater and the increased mental and physical strain must reduce resistance. Exposure or immersion due to enemy action also necessarily plays a part. No one can tell how long the war will last, and it would undoubtedly be sound policy to eliminate the open infectious cases as a beginning. It seems certain that after a few years of routine radiography and elimination of carriers the incidence of disease would rapidly diminish. Some system of medical record cards would have to be devised so that re-examination at suitable intervals could be arranged.

Earlier Treatment

Earlier diagnosis would be useless unless followed by earlier treatment. Here also there is room for improvement. Just as in the case of landsmen, a man may ignore advice to have treatment and may continue to work, to his ultimate cost. Indeed, it is quite possible for a man rejected by one company's doctor to seek employment with another company or in a different port and to be accepted. Short of some medical record card as suggested above, there seems to be no way of stopping this; but such a system presents obvious difficulties. Those who make a diagnosis of tuberculosis in a seaman should therefore stress the seriousness of the matter and the necessity for early treatment. The word "tuberculosis" means little to these men. They may never have heard of the disease, and much less ever thought that they might themselves be afflicted. I believe that an educational anti-tuberculosis campaign, on the lines of those organized on land by the N.A.P.T., would be of immense value. By arousing the interest of the shipping companies and their medical staff it should be possible to organize simple talks to the men and to distribute suitable literature. This would help to secure both earlier diagnosis and earlier treatment, and the chronic cough would not be so readily overlooked by both the victim and the ship surgeon.

The provision of beds in suitable institutions for the number of patients expected may present difficulty, but the wide distribution among the different ports should make this problem capable of solution. It is difficult to say whether earlier diagnosis would materially shorten the duration of treatment required. In some cases this would be so; in others, in which collapse therapy by surgical means proved to be practicable because of less extensive disease, the duration of sanatorium treatment might be lengthened. Moreover, there should be fewer patients dying shortly after admission. A more careful assignment of cases would be required so that beds available for active treatment should not be wasted on hopeless cases. It seems probable, however, that more beds would have to be made available in this sanatorium.

Summary

A brief review is given of the evidence available regarding the mortality from tuberculosis in the Merchant Navy.

It appears that the mortality rate is higher than that of the general population ashore.

Men from the Merchant Navy arrive for treatment in a more advanced stage of disease than the general population.

Earlier diagnosis is essential. This could be achieved by more careful routine physical examination, but, best of all, by routine radiography.

An extensive educational and anti-tuberculosis campaign should be organized with a view to earlier diagnosis and treatment.

In view of the importance of the Merchant Navy, every means possible should be employed to maintain the health of these men. Routine radiography is therefore fully justifiable, and would lead to the elimination of sources of infection.

Research in mass radiography for the Merchant Navy is about to be carried out by the Seamen's Hospital Society.

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PARALDEHYDE IN OBSTETRICS

WITH SPECIAL REFERENCE TO INTRAMUSCULAR INJECTIONS

BY

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Paraldehyde in various forms and prescriptions has been used in obstetrics as well as in other branches of medicine for a considerable number of years. It was highly extolled by F. N. Reynolds in his *Relief of Pain in Childbirth* (London, 1934) as one of the very best methods of relieving pain in labour. He advocated its use per rectum mixed with olive oil (1 dr. of paraldehyde to 1 oz. of olive oil, with an average dosage of 6 to 8 oz., according to the patient's weight). This was preceded about half an hour earlier by an injection of morphine gr. 1/6 with hyoscine gr. 1/150.

Particulars of the Method

I have used this method, mainly in primiparae, in a large number of cases for the past 8 years, both in hospital and in private practice. A midwife should carry out this treatment only on a doctor's instructions.* She must have a good knowledge of the technique of giving it, and must observe the following details:

1. The bowel should be empty at the time of injection.

2. The injection should be run into the rectum by tube and funnel, with a large catheter terminal, fairly rapidly (approximately 4 minutes) in between two pains. Should a pain occur during the injection the nurse should hold the buttocks together with a pad of gauze at the anus, to prevent return flow. The same precaution is necessary for about 10 minutes when the injection is completed.

3. In spite of the advocated dosage of 1 dr. of paraldehyde to 1 oz. of olive oil, it is better to put the dosage of paraldehyde estimated into a total of 5 to 6 oz. of olive oil, otherwise there is increased danger of its being returned.

4. Obviously a very low presenting part will add to the difficulty.

Main Uses.—With this method the ideal procedure is in a prolonged first stage, and for practical purposes this will mainly

* Report of investigation by the British College of Obstetricians and Gynaecologists, *Lancet*, 1936, **1**, 283.

concern primiparae with 2 to 3 fingers dilatation, with severe pain and slow progress. It will very often be useful also in multiparae with imperfect rotation of the occiput.

As with all methods of analgesia in obstetrics, the technique will vary according to the different types of patient. Provided, however, that the proper time is chosen to use it, one can count on anything between 4 and 8 hours of effective analgesia (and also a quite high degree of amnesia) if the patient does not unexpectedly develop second-stage pains—a condition which, of course, is due to imperfect judgment of the progress of labour, but which, even so, is of no great disadvantage, as any of the ordinary methods of anaesthesia used in the second stage are still applicable. About 15 to 20 minutes after the injection the patient begins to sleep fairly deeply between pains, but partially wakes up with a variable degree of restlessness during active contractions. Even then, if only gently restrained and not talked to, she will often know nothing about this period the following day. It is, however, imperative that a midwife be in attendance all the time, as the restlessness may lead to a patient's falling off the bed during the contraction phase. In a high proportion of cases—e.g., primiparae with 2 to 3 fingers dilatation and the occiput in front—this method will obscure and very often completely banish pain not only until full dilatation has occurred but possibly until the head is actually visible, and sometimes even to crowning. It is not expected to be efficient for actual delivery of the head.

Limitations.—It is quite obvious that the most important point is a fairly accurate assessment of the progress of labour. The fact that the patient must be continually watched by the midwife is perhaps a slight disadvantage, but this applies equally to a great many other methods. Again, as usual, some estimate of full dilatation is necessary without repeated examinations, but for practical purposes the bulging of the perineum and the gradual opening of the anus during the pains are suggestive enough to warrant examination. For an unusually prolonged first stage, such as is caused by slow rotation of the occipito-posterior or gradual moulding, with minor degrees of disproportion, it may even be necessary to repeat the routine after 8 hours. A further difficulty arises when the patient is becoming uncontrollable or perhaps has agonizing pain, and something rather quicker than the rectal paraldehyde method is required: it was this point which led me to give it by intramuscular injection. This was first suggested to me by Capt. P. T. Northover, R.A.M.C., who had seen it used with success in mental work.

The Method in Use

Obviously, provided that it acted well, a smaller dose would be required to get the patient under control quickly, and for reasons of general convenience 10 c.cm. (2.8 dr.) was tried provisionally. This amount is not too bulky as an injection, though it is better given in two 5-c.cm. doses, separated by an inch or more, without removing the needle from the original skin puncture. The outer side of the thigh, at about the middle, was chosen for injection (I have used this site for all intramuscular injections for more than twenty years). Morphine 1/6 gr. can be given or omitted according to circumstances.

As a rule the patient is under control and definitely sleepy within 10 minutes. If less than 3 to 4 hours is expected to effect the birth of the child there may be no need to increase the dosage, but if 6 to 8 hours is required the remaining 3 to 4 dr. can be given in olive oil by the rectum once the patient is under the intramuscular dose.

This intramuscular method has been extremely useful in occipito-posterior cases that were partly rotated and required 2 to 3 hours longer to complete. It has also been found very useful in severe toxic cases of the pre-eclamptic type, in which it was desirable to keep the patient quiet when not sufficiently dilated for intervention.

Paraldehyde seems to be completely harmless in the renal damage of pregnancy toxaemia, and after dealing with many cases of this nature it was realized that the method might be particularly useful for actual eclampsia. It has now been employed in 10 consecutive cases of fully developed eclampsia. It can be repeated in 8 hours or more should restlessness, twitching, or the onset of labour occur, though in these acute toxic cases labour is often notoriously silent and relatively painless. By such means the majority of eclamptics can be well controlled for 24 hours, and after this interval it is extremely rare for the fits to recur, and most patients will recover. There appears to be no harm to either mother or child from the use of paraldehyde. The child may be a little on the lazy or sleepy side for a matter of a few hours, or even to a slight extent for one or two days, but no ulterior results need be anticipated.

All 10 eclamptic cases treated with the primary paraldehyde injection, followed by a further instillation by rectum, recovered, but naturally no conclusions can be drawn from such a small number. In a few instances there was some pain at the site of injection, but even though this may continue for one or two days it seems a very minor point compared with the relief of pain at the critical time.

RESULTS OF BACTERIOPHAGE TREATMENT OF BACILLARY DYSENTERY AT ALEXANDRIA

A STATISTICAL RETROSPECT*

BY

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The war, with its influx of troops into the Near and Middle East, has underlined the importance of therapeutic control of bacillary dysentery. The experience of more than twelve years of the use of anti-dysentery bacteriophage in the city of Alexandria may therefore usefully be placed on record. The present paper is based on a statistical investigation of the mortality rates from dysentery over the period 1928-40, and a comparison is made between the statistics for Alexandria and those for the rest of Egypt, where phage has not been so freely available. The direct investigation of bacillary dysentery mortalities has not been possible because an accurate knowledge of the annual number of deaths and of cases in various localities in the country is lacking. The problem has had to be tackled by inference, because for the most part only the aggregate statistics of cases and deaths for the two forms of dysentery, amoebic and bacillary, are tabulated in the official returns.

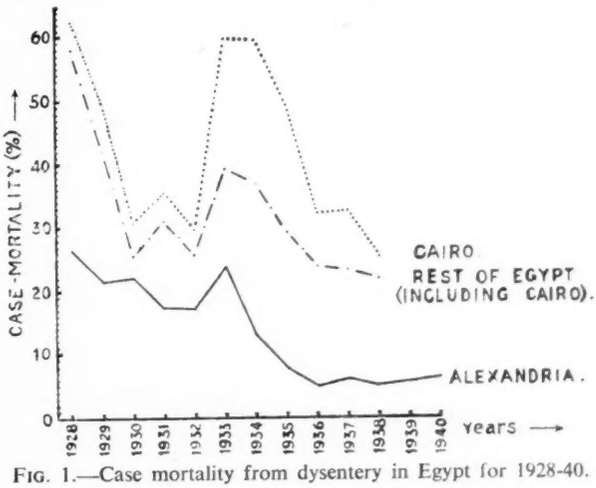

FIG. 1.—Case mortality from dysentery in Egypt for 1928-40.

[The author furnishes a table showing for the period 1928-40 the number of cases and deaths and the percentage case mortality for dysentery in Alexandria, in Cairo, and in the rest of Egypt (including Cairo). In Alexandria the total annual number of cases of dysentery has averaged about 650 during this period, and has not gone down to any great extent; but the number of deaths has fallen sharply, and the case mortality, which in the earlier years of the period was over 20%, has not during the last five years exceeded 6.5%. In Cairo, on the other hand, there has been no such marked diminution in case mortality, which averaged 29% for the years 1936-8. The

* Abridged for publication.

author considers that in view of the slightness of the variation from year to year in the case ratio of bacillary to amoebic dysentery,* and of the recognized constancy of the treatment of amoebic dysentery with emetine with successful results, the variations in the total numbers can be indirectly used, in the absence of direct knowledge as to the bacillary numbers, as an index of the variations in bacillary case mortality. He mentions certain qualifying features of the statistics, both general and local, but these do not greatly modify the general deduction. The dysentery case-mortality curves (amoebic and bacillary) for Alexandria, for Cairo, and for the rest of Egypt (including Cairo) are shown in Fig. 1.]

It will be seen that the case mortality for Alexandria has fallen steadily from approximately 25% in 1928 to 5% in 1938, with the exception of a transitory rise of about 8% in 1933. The corresponding Cairo case-mortality curve shows a quite erratic course varying between a maximum rate of over 60% in 1928 and a minimum of 25% in 1938.

State of Phage Therapy in Egypt

The only factor which seems to explain the decline in mortality rates at Alexandria as compared with the rest of Egypt is the use of bacteriophage by the medical profession of that city, where it has become an established rule to treat acute bacillary dysentery and its frequent precursor, the acute enteritis popularly known as "gyppy tummy," with an ampoule of 2 c.cm. of bacteriophage as soon as possible, and thereafter an ampoule every 4 hours, while the patient goes to bed and is put on a starvation diet, with Vichy or Evian water only, for 24 hours. Thirteen years ago certain early work from these laboratories was published on the phage therapy of bacillary dysentery (Compton, A., *Lancet*, 1929, **2**, 273, 528) which established clinically the success of the treatment to the extent that a definite demand for phage became established. With the inauguration, about 1930, of the Laboratoire de Bactériophage, Paris, under the direction of Prof. d'Herelle, for the manufacture of commercial phages of controlled potency, it became possible to meet the demand with reliable therapeutic material. Since then the Municipal Public Service in Alexandria has budgeted annually for commercial bacteriophages for the specific treatment of bacillary dysentery and like conditions in the municipal hospitals and children's clinics. Thus the phage therapy of bacillary dysentery has been employed in Alexandria on an important scale for at least 12 years. In Cairo, phage has not been used to any appreciable extent until recent years, and the rest of Egypt may be considered as practically not having known phage therapy at all

There is reason to believe that if the treatment of bacillary dysentery were stabilized throughout the country, in the same way as amoebic dysentery is stabilized in terms of emetine injections, the total statistics from both forms of the disease would result in mortality curves of very much the same aspect, no matter what locality was selected for study.

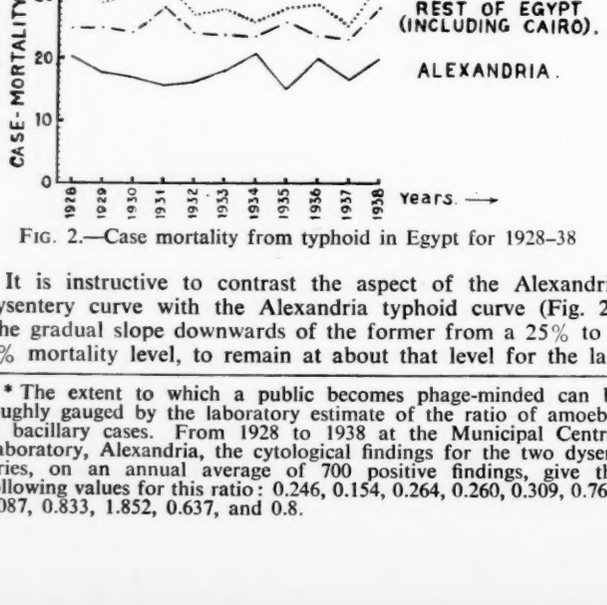

FIG. 2.—Case mortality from typhoid in Egypt for 1928–38

It is instructive to contrast the aspect of the Alexandria dysentery curve with the Alexandria typhoid curve (Fig. 2). The gradual slope downwards of the former from a 25% to a 5% mortality level, to remain at about that level for the last 5 years, and the comparatively stationary aspect of the typhoid curve, showing only minor oscillations about a mean level of 18%, are significant. If the explanation of the comparatively horizontal course of the typhoid curve is that no change of any sort has taken place in the treatment of typhoid in the period, then the progressive fall of the dysentery curve suggests an improvement in the treatment of dysentery at Alexandria. This is known to have occurred; the treatment of amoebic dysentery has not undergone any change during the period taken, but that of bacillary dysentery has been altered by the introduction of phage therapy. This improved position represents an actual saving of some 70 lives a year as compared with 10 years ago. During the first three years of the period (1928-30) there was in Alexandria an annual average of 105 deaths from the dysenteries, and during the 3 years 1938-40 the average number of deaths was 35.

Summary and Conclusion

The analysis of the official dysentery statistics for Egypt indicates that Alexandria occupies a much more favourable position in case mortality from dysentery than anywhere else in Egypt. This cannot be due to the better treatment of amoebic dysentery, for that is uniform and standardized throughout the country; nor is it due to geographical or climatic factors, for the typhoid case-mortality rate for Alexandria and for Cairo has not appreciably changed. The conclusion reached is that the cause of Alexandria's favourable position is the use of bacteriophage therapy for bacillary dysentery.

The statistical evidence, whether convincing or not to the statistically minded, is only part of the case; a much more convincing part is clinical observation, which shows the favourable effect of phage preparations administered early in dysenteriform conditions of a bacillary nature.

* The extent to which a public becomes phage-minded can be roughly gauged by the laboratory estimate of the ratio of amoebic to bacillary cases. From 1928 to 1938 at the Municipal Central Laboratory, Alexandria, the cytological findings for the two dysenteries, on an annual average of 700 positive findings, give the following values for this ratio: 0.246, 0.154, 0.264, 0.260, 0.309, 0.763, 1.087, 0.833, 1.852, 0.637, and 0.8.

CARE OF THE TUBERCULOUS

As announced in the House of Commons last October (*Journal*, 1941, **2**, 530), the Medical Research Council is investigating the causes of the rise in the incidence of tuberculosis, and pending the result of that inquiry the Ministry of Health has circularized local authorities (Circular 2526) on the need for maintaining and improving their tuberculosis services, wherever possible. The increased incidence in 1940 over the figure for the previous year, as revealed by mortality statistics, was most noticeable among young women between the ages of 15 and 25, the death rate per million for respiratory tuberculosis in this group having risen from 762 in 1939 to 881 in 1940. Local authorities are asked to review their arrangements for the care and after-care of tuberculous persons, and are reminded that the annual report for 1935 of the Chief Medical Officer indicated (pp. 77-81) the steps that could be taken in the interests of patients and their families. Beds in E.M.S. hospitals are released from time to time for the treatment of tuberculosis, and if any authority needs more beds for either hospital or sanatorium treatment the medical officer should take up the matter with the Principal Regional Medical Officer, who has been instructed to do all he can to help. Shortage of nursing and other staff remains, however, a major problem, and much has been done centrally to solve this by the recognition of nursing and of domestic duties in hospital as work of national importance, and by the appointment of a committee to draw up agreed scales of salaries for State-registered and student nurses. But effective results can only be obtained if this is supplemented by local effort. Salaries in sanatoria, etc., should be considered in the light of the revised rates payable to the Civil Nursing Reserve, and salaries and conditions of service together should be such as to counteract any possible prejudice against the work. A study of the memorandum "Tuberculosis Among Nurses," issued by the Joint Tuberculosis Council in 1937, might indicate where improvements in existing conditions are necessary. Recruitment might be stimulated by publicity (for example, by articles in the lay press, preferably by well-briefed journalists) on the human importance of the work done in tuberculosis institutions, the life of the nurses there, etc. The employment of ex-patients on the nursing and domestic staff should be encouraged, and also the transfer to tuberculosis institutions of any suitable nursing staff who can be spared or can be replaced from the Civil Nursing Reserve.

DIABETES MELLITUS AND PREGNANCY

BY

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The following case report illustrates some of the interesting changes that take place in the carbohydrate tolerance of the mother during pregnancy, and stresses the consequent necessity for careful and continuous control during this period to avoid the dangers of acidosis and to correct depletion of the glycogen stores due to any toxaemia which may arise. Since the introduction of insulin the maternal death rate in diabetics has greatly decreased. A survey of the literature shows that in pre-insulin days the immediate mortality rate was as high as 30%, and rose to something approaching 50% about two years after delivery. The average figure for immediate mortality, with control with insulin, is now 5%, but this is still considered to be at least 6 times greater than for non-diabetic women. These somewhat favourable statistics have been obtained from series in which special care has been exercised, so it is probable that the dice are still very much loaded against the diabetic pregnant woman. The foetal mortality rate still remains very high, and, according to many observers, pre-partum, intra-partum, and post-partum deaths of infants born of diabetic women still continue at approximately 40%. Any method which might reduce this high death rate is worthy of trial, and for this reason early Caesarean section, followed by specialized care of the infant after delivery to prevent hypoglycaemia, as advocated by Prof. Wilder of the Mayo Clinic, was tried in the present case with a successful result. One case is of no use in assessing the value of any particular form of therapy; but I hope the method will be tried by others in a larger number of cases. The necessity for some stabilized method which offers a better chance for the infant is more urgent now that the fertility of diabetic women is far greater than it was.

Case Report

The patient, a married woman aged 28, was a known mild diabetic. She came to the out-patient department on Aug. 25, 1941, 5 months pregnant, her urine giving a red reaction to Benedict's test and her fasting blood sugar amounting to 0.206%. She was admitted next day and was not able to leave during the remainder of the pregnancy. The treatment of the case falls under three main headings.

1. Care of the Mother during Pregnancy

The essentials are primarily an optimal nutrition with an adequacy of vitamin B and calcium, and adequate control of the carbohydrate metabolism, due regard being paid to the dangers to both mother and foetus of the development of hypoglycaemia. As pregnancy depresses the renal threshold in patients with established diabetes I found it safer (owing to the difficulties of frequent blood-sugar estimations) to regulate treatment so that the urine almost always contained a trace of sugar. Also, for control it was necessary that 4-hourly urine analyses should be done, for insulin requirements during pregnancy are many and varied. In the present case it is not known what the actual requirements were during the first 5 months (the patient then taking 20 units of protamine-insulin daily), but while under my care these requirements varied between 85 and 25 units a day (given in 2 doses). Broadly one can say that as the pregnancy advanced during the last 3 months, and especially during the last 6 weeks, the carbohydrate tolerance increased, so that just before delivery very much less insulin was needed for effective stabilization. This accords with the theory that the pancreas of the foetus in diabetics helps in the maternal demand for insulin in the later months of pregnancy.

The patient only once had severe hypoglycaemia during the initial stages of stabilization. This was at 2 a.m., when she was found by the nurse in coma, sweating profusely and trembling. She was easily brought round by adrenaline, followed by 10 c.cm. of 50% glucose intravenously. The coma had occurred during sleep without any warning to the patient, and for this reason it is clear that unless very careful watch is kept the dosage of insulin given must be such that there is little danger of hypoglycaemia developing. The diet contained 130 g. of carbohydrate, and was the usual balanced diet—at least 1 pint of milk a day being given in order to ensure an adequate intake of calcium.

It was decided to perform Caesarean section on Dec. 9—i.e., the beginning of the 37th week. Until Dec. 6 there had been no evidence of toxaemia, but on that date a slight trace of albumin was found in the urine, and the next day this had increased in amount and the blood pressure had risen from 120/60 to 180/100; there was also some oedema of the feet. Fluids were restricted and a low protein diet was ordered. On the 8th the B.P. was 148/96; albuminuria had diminished; some bile was present in the urine, but there was no clinical jaundice. The foetal heart sounds were well heard, and it was decided to adhere to the original plan of doing a Caesarean section on the next morning.

2. Management of Labour and Puerperium

The routine to be followed in these cases is an early Caesarean section at the 36th to 37th week of pregnancy. White has written: "Prolonged difficult labour, normal or induced, has disadvantages for the diabetic. Those of immediate importance are the early exhaustion of the glycogen reserve and the danger of sepsis, the danger of hyperinsulinism, exogenous and endogenous, and the danger of acidosis. The baby has not the vitality of the child of the non-diabetic, and consequently the risk is great of injury from long labour to this large overdeveloped but at the same time flabby child. Furthermore the induction of labour does not answer the problem as well as Caesarean section, because induction is not safe until the cervix is soft, and the cervix may not be soft until after the baby has died." Also, at 36 weeks labour may fail to begin even after surgical induction, and, in addition, surgical induction introduces an added risk of sepsis.

Consequently, in our case, at 9 a.m. on Dec. 9 a classical Caesarean section was carried out by Dr. M. I. Ealing under general anaesthesia (gas-oxygen, and the very minimum of ether) given by Dr. Roxburgh. Pre-operative treatment was that given for any other surgical operation on a diabetic—viz., half the usual morning dose of insulin and no breakfast. The operation was uneventful and there have been no surgical complications. The B.P. steadily fell until on Dec. 14 it was 110/70. The insulin requirements were based on routine blood-sugar estimations for the first four days after operation, but there was never any anxiety, and 15 units per dose was the maximum needed. Since Dec. 16 the patient has been adequately controlled on a morning dose of 15 units and 10 units at night on a diet containing 130 g. of carbohydrate. All evidences of toxaemia have gone—blood pressure and blood urea normal and no albuminuria.

3. Management of Infant

The principal difficulty in these cases has apparently been the death of the infant soon after birth, and I am inclined to agree that most likely this is due to hypoglycaemia. There is evidence that the foetal pancreas aids the maternal demands for insulin during the later months of pregnancy; if this is so, then at birth the foetal pancreas is geared up to a much higher pitch than is necessary—i.e., far in excess of the requirements of the infant alone. There is slight evidence for this view in the present case: for an estimation of the sugar in the cord blood at birth gave a figure of 0.128%, whereas, despite continuous feeding with glucose (as described later), the child's blood sugar at 4 p.m. the day after was only 0.08%. The treatment of the child was based on this supposition, and it certainly worked well in the present case.

At birth the child was very blue, and the following restorative measures had to be taken before it responded: (*a*) aspiration of mucus and amniotic fluid from the pharynx and trachea; (*b*) inhalation of pure carbon dioxide followed by a mixture of 10% CO_2 and 90% oxygen; (*c*) artificial respiration; and (*d*) injection of 10 minims of coramine followed by 0.5 c.cm. of lobeline into the cord. When breathing normally it was immediately given 5 c.cm. of 10% dextrose solution into each buttock. This dose was given—either orally or by injection—2-hourly for the first 48 hours (5 injections were necessary). During this time no muscular twitchings were observed and there was practically no cyanosis, so any tendency to hypoglycaemia had been combated by these measures. After the first 3 days the dextrose solution was changed to Nestlé's milk and attempts at breast-feeding were started. These had to be discontinued, as the mother's milk was not adequate either in quantity or in quality.

The child was treated as for prematurity, and intranasal oxygen was given intermittently for the first 24 hours. This was not required subsequently, and progress has been uneventful.

The baby was under constant observation for the first 72 hours of life: should hypoglycaemia develop during this period only prompt treatment with parenteral glucose and oxygen can avert the death of the child.

Summary

A case of diabetes mellitus and pregnancy is described. The salient features appear to be: (1) The varying carbohydrate tolerance during the pregnancy and the necessity for avoiding hypoglycaemia. (2) Caesarean section as the means of delivery —to be done at the 36th to 37th week of pregnancy. (3) The care of the infant after birth to combat the development of hypoglycaemia, which is the most likely cause of death.

It is thought that by the means adopted the dangers to both mother and child normally associated with pregnancy in a diabetic can be minimized.

I should like to express my indebtedness to Dr M. I. Ealing for the interest she has taken in this case and for performing the Caesarean section; to Dr. Barbara H. Fiddian, without whose conscientious co-operation the case would not have turned out to be the success it has; and to the Sister and Staff Nurse.

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Medical Memoranda

Abdominal Pregnancy: Delivery of a Living Eight-months Baby

The following case is interesting and rare enough to warrant publication.

CASE REPORT

The patient, aged 41, was admitted to hospital on Aug. 12, 1941, with a history of irregular slight losses almost every week since her last normal period at the end of April. She had had one living child after a normal confinement 20 years previously. She also had some difficulty in micturition. Examination revealed a distended bladder, confirmed by catheterization. On vaginal examination a soft swelling was found in the pouch of Douglas in which ballottement could be obtained, and the cervix was displaced upwards and forwards behind the pubes. A diagnosis of retroverted gravid uterus was therefore made. After a few days of catheterization and lying over on her abdomen, she was able to pass urine normally, and the uterus could be felt abdominally, rising out of the pelvis. The swelling in the pouch of Douglas, in which foetal parts could be felt, remained and could not be displaced, but the cervix became normal in position. She had no further loss P.V., and she was discharged on Aug. 21 to attend the ante-natal clinic as a case of sacculation of a retroverted gravid uterus. She was then nearly 4 months pregnant.

She was last seen at the ante-natal clinic on Sept. 19, when the uterus appeared to be enlarging normally, the height of the abdominal swelling being at the level of the umbilicus. On vaginal examination the swelling filling the pouch of Douglas was still present, and was still thought to be a sacculation of the posterior uterine wall. The patient did not attend the ante-natal clinic again as she decided to have her baby at home, in spite of being advised that she should be delivered in hospital.

She was readmitted to hospital on Dec. 31 with a history of red loss P.V. for 2 days and of having passed two small pieces of tissue that morning. She was complaining of vague backache. She also said that she had been having abdominal pains on and off for the past three months; these had been severe enough to keep her in bed at times. On examination the abdomen was enlarged to nearly full term. The foetal parts were very easily felt, with the limbs in front, and the foetal heart was heard in the L.O.P. position. Just above the pubes and towards the right iliac fossa was a rather elastic but solid tumour, which felt like a fibroid in the lower part of the anterior wall of the uterus. On vaginal examination the head was found to be well down in the pelvis, and occupying what was thought to be the sacculation of the posterior wall of the uterus very much thinned out. The cervix was displaced forwards and upwards behind the symphysis pubis. The os was one finger dilated, with some tissue presenting through the os.

It was decided that a Caesarean section should be performed so as to avoid the risk of rupture of the thinned-out posterior wall of the lower segment; this appeared to be occupied by the head, which was pushed so low down in the pelvis that it could not be displaced upwards. The cervix, being displaced up behind the symphysis pubis, was unlikely to dilate satisfactorily. Owing to the ease with which the limbs could be felt kicking beneath the abdominal wall, abdominal pregnancy was suggested.

A laparotomy was performed shortly after admission. An abdominal pregnancy was found. The foetus was enclosed in its amniotic sac, which was lying among the intestines towards the left side of the abdomen. The sac was opened and a normal living male child of about 36 weeks and weighing 5 lb. 10 oz. was delivered. Attention was next directed to the placenta. The most extraordinary thing was the placental attachment. The placenta, which had formed itself into a globular mass, had a thick pedunculated attachment to the back of the broad ligament in the region of the right tube. It was thus only necessary to divide the pedicle between two clamps to deliver the placenta. The lower portion of the amniotic sac was adherent to the sigmoid colon and the rectum, and it would have caused a lot of haemorrhage to separate this. It was therefore decided to leave the lower part of the sac and drain it. The uterus was found to be enlarged to about the size of a 14-weeks pregnancy. This was the tumour that was felt towards the right iliac fossa. The operation was completed with the loss of hardly any blood.

The mother made an uninterrupted recovery. The baby also did very well, being discharged from hospital with his mother 25 days after delivery weighing 6 lb.—6 oz. over its birth weight. The baby was still living and well when last seen on April 23, weighing 12 lb. 8½ oz. at 16 weeks, and was being breast-fed, with complementary feeds.

COMMENT

This was apparently a case of secondary abdominal pregnancy, resulting from rupture of a right tubal pregnancy at an early stage, the intact amnion with the enclosed foetus escaping into the abdominal cavity and continuing its growth. The case is unique in having such a pedunculated attachment of the placenta to the broad ligament, making its separation so easy by simply dividing the pedicle between two clamps and thus resulting in very little loss of blood. The tissue passed by the patient was a decidual cast from the uterus.

I wish to thank Mr. E. S. Clayton, medical superintendent, for permission to publish this case and for his help with it.

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Hyperplasia of the Gums due to Dilantin

Cases of hypertrophy of the gums after prolonged administration of sodium diphenyl hydantoinate (known as dilantin or epanutin) for the treatment of epilepsy have been reported in the U.S.A., but not, apparently, in this country, where it is possible that they may have occurred but not have been associated with the drug.

The case now described is that of Miss X, aged 26, sent to this hospital for dental treatment. There was gross hypertrophy of the gums of the maxilla only, half of the tooth crowns being covered with hard fibrous nodular masses, with no tendency to bleed and no discomfort except where the interdental papillae have overgrown between the teeth so that mastication is painful. The colour is that of normal gum. The medical registrar of the West End Hospital for Nervous Diseases was good enough to tell me that the patient has been on dilantin gr. 1 t.d.s. since May, 1939, and first complained of gingivitis in Feb., 1940. Some carious molars have been extracted, and radiographs show some apical infection of other teeth.

Cases reported in America usually have had the gums of both jaws affected. A suggested scorbutic origin is disproved by the fact that ascorbic acid neither prevents the occurrence nor cures the condition in the gums; also the microscopical appearance shows an excess of collagen fibres, as well as hyperplasia of the corium, together with that of the covering epithelium to a lesser degree. Haemorrhages are unusual.

It is suggested that careful oral hygiene when the drug is first used may prevent the overgrowth, and that if overgrowth occurs the drug may still be given provided that all sources of infection and irritation are eliminated. Gingivectomy of the grosser masses may be performed, although some writers are of the opinion that the drug must be discontinued if recurrence after excision is to be avoided.

A boy of 11 years attended here some time ago with a similar growth of gums of both jaws; an attempt will be made to follow the case up, as possibly being due to the same drug.

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Reviews

BLOOD TRANSFUSION

The Blood Bank and the Technique and Therapeutics of Transfusions. By Robert A. Kilduffe, M.D., and Michael DeBakey, M.D. (Pp. 557. 37s. 6d.) London: Henry Kimpton. 1942.

A book reviewing the recent work on blood transfusion has been greatly needed. So much has been added to our knowledge of the subject in the last two years that it has been difficult even for the specialist to keep pace with the literature. Dr. R. A. Kilduffe and Prof. DeBakey attempt in their monograph to cover the past history of blood transfusion and its modern developments. They present, indeed, a most comprehensive review of the whole subject, supplying in addition complete bibliographies attached to each chapter and 214 well-produced diagrams and illustrations. There are chapters dealing with rational indications and contraindications for transfusion; a sound description of the technique of blood typing and compatibility tests, a discussion of the changes occurring in stored blood, the operation of a blood bank, the value of plasma transfusion, and the methods of plasma transfusion. Serum, as is customary in America, receives scant attention. The technique of transfusion and possible complications are also fully discussed. It is unfortunate that the fundamental work of Mollison and Young on the survival rate of stored erythrocytes is not appreciated. These observers have shown that corpuscles stored for 18 days survive in the circulation as long as fresh cells. It is therefore misleading to state that erythrocytes stored for longer than 7 days are relatively inefficacious.

In spite of its admirable qualities, the book will inevitably leave the English reader who worked through Dunkirk and the air raids on Britain with a sense of unreality if not of irritation. Shock, as seen in air-raid casualties, does not fit the classical theories. Treatment cannot be applied by theoretical rule. We cannot say of a man with multiple injuries that he has lost so much blood and therefore he must receive a corresponding amount in a definite period of time all calculated upon a fine formula. Few practical workers would, for instance, agree that one pint of plasma quickly transfused will suffice for the ordinary case of wound shock. The same criticism is applicable to the description of methods of preparation of serum and plasma. It all sounds so easy if you follow the rules. Experience in England with mass production of these blood derivatives has shown that, though excellent results are obtained, there are innumerable difficulties to be surmounted. Transfusion therapy in America was still in its peacetime armchair when this monograph was written.

PSYCHO-ANALYSIS RE-EXAMINED

Psychoanalytical Method and the Doctrine of Freud. By Roland Dalbiez. With an introduction by E. S. Strauss, M.D., F.R.C.P. Vol. I: Exposition. Vol. II: Discussion. Translated from the French by T. F. Lindsay. (Vol. I, pp. 415; Vol. II, pp. 331. Two volumes 40s.) London, New York, Toronto: Longmans, Green and Co.

This work in two volumes consists of a systematic re-examination of Freud's work in the light of pure philosophy and logic. The writer stresses that Freud made no claim to be a philosopher and was even at pains to show how little use he had for the breed. Nevertheless the first volume, which contains a painstaking recapitulation of Freud's views, finds little difficulty in reconciling Freud's formulations of his clinical material with philosophical tenets. The chief comment on Freudian psychological theories appears in the first volume in the author's views on Freud's "Dream Psychoanalysis." Dalbiez maintains that the theory of dreams, which is the corner-stone of Freud's work, is a theory of non-cognitive but constructive mental activity. The dream-thoughts are characterized by the absence of reality; they follow one another associatively—that is to say, in a way not exhibiting causal sequence as happens in thinking which is related to the external world. For the understanding of this type of event Freud's method is admirable and his work "the most profound analysis that humanity has known"; but for the understanding of other realms of being, "the artistic aspects of art, the scientific aspects of science," and the like—in other words, the realms where thought is related to an object—Freudian method and Freudian psychology are considered to be of little use. "Psycho-analysis leaves the problems of the human soul where it found them."

The author conscientiously tackles the logical difficulties in Freudian method. For example, being troubled by the criteria of validity in the interpretation of ideas in a dream, he poses five criteria: "evocation," "similarity," "frequency," "convergence" of a variety of indications, and "verification" by a third party. The last must as a rule be impossible to apply, but the point at issue—namely, the validity of Freud's method of dream interpretation—seems on the whole to be conceded. He discusses also the Pavlovian experiments so far as they seem to have any relevance to Freudian theory, and considers that the Freudian and the Pavlovian formulations of the dynamics of the psychoneuroses can be made to harmonize.

The translation has been made into very readable English, and the book is well documented with case-histories personally observed by the author. For those who are philosophers it must be satisfactory to know that a critical re-examination of this sort from the standpoint of philosophy has been made, while those who are not will be glad to learn that philosophy finds little to quarrel with in psycho-analytic method as distinct from psycho-analytic "metapsychology."

DESIGN AND PURPOSE

Design and Purpose. By Frederic Wood Jones, D.Sc., F.R.S., F.R.C.S., Professor of Anatomy, University of Manchester. (Pp. 84. 5s.) London: Kegan Paul, Trench, Trubner and Co. Ltd. 1942.

It would be a gain for the outlook of humanity if, in the readjustment of thought which is occurring, a general belief in the purpose of human life could be restored once more. This is Prof. Wood Jones's aim in his Purser Lecture, *Design and Purpose.* Those who enjoyed his *Life and Living* will not be disappointed in this later essay. He considers that when primitive animism proceeded through polytheism to monotheism, the idea that man was created in God's image separated him in thought from the rest of creation, which he regarded as merely created for him. For centuries this shrunken conception sufficed his intellectual needs and satisfied his curiosity. Darwin opened a new vista for all who were prepared to see a great wholeness in the ordering of things, but for some reason, which at this distance seems beyond understanding, his thesis led not to spiritual advancement but to intellectual pessimism. Yet even the term "struggle for existence" was not of his coining, and he used the phrase "survival of the fittest" in a large and metaphysical sense, including the dependence of one being on another. It was left to others to misapply them in justification of war and destruction. Such revolts as have been made against the pessimistic outlook have usually been sentimental, metaphysical, or theological; of late, however, a need for a new synthesis has been expressed by workers in many scientific fields.

The author then discusses the astonishing identity in basal structure underlying all matter from the atom to the universe, maintaining that there is uniformity of plan and apparent design manifest throughout. The moment we see life we see purpose, though he does not presume to inquire into the nature of that purpose. What he does see is that all things, animate and inanimate, are travellers along a road of purpose on which all wayfarers have equal rights. The end of the road we do not know, but here is a bracing tonic to help us on the journey.

Notes on Books

The fifth edition of Dr. E. B. JAMIESON'S *Companion to Manuals of Practical Anatomy* has appeared, with some rearrangement of the order in which the systems are presented (Oxford University Press, 15s.). These changes are stated to have been introduced with the object of bringing the book into more complete harmony with certain of the manuals which it is intended to supplement. It thus appears in the form of an auxiliary in the way of summarizing the more complete and full descriptions in certain of the larger volumes on the subject. The author has undoubtedly succeeded in bringing most of the important facts which a medical student preparing for an examination in anatomy should know within the compass of a small book of just over 700 pages. It is not the type of book, however, which would be most useful to a junior student before he has acquired a clear mental picture or visual knowledge of the main facts of anatomy and embryology, since it is not

illustrated, and it is with few exceptions purely descriptive, the functional meaning or practical application of the various objects which are described not being sufficiently emphasized and in many cases not even mentioned. The book may be regarded as an admirable synopsis of the general facts of human anatomy and embryology and of value to senior students who are preparing for an examination on these subjects and have only a limited time for revision. Employed in this way it may be confidently recommended as a reliable help to the difficult task of marshalling the numerous details of these subjects within a given time.

To most of us the name of *Count Cagliostro* bears a somewhat vague connotation as that of a swindling charlatan of the second half of the eighteenth century, contemporary of, and as it were half-way between, Mesmer and Casanova; and that is, in brief, a summary of the career of this Sicilian adventurer, whose real name was Giuseppe Balsamo. Mr. MICHAEL HARRISON has expanded this to a full-size biography (Rich and Cowan, 18s.), much of which, as he admits, is based upon surmise rather than reliable records. He is interested much more in the man's swindles and confidence trickery than in his quack doctoring; and a distinctly turgid style with a tendency to irrelevance further detracts from the strictly medical interest of the memoir. A point of some slight interest is the undoubted resemblance between the portrait of Cagliostro which is reproduced as a frontispiece and the well-known likeness of another contemporary, John Hunter.

Preparations and Appliances

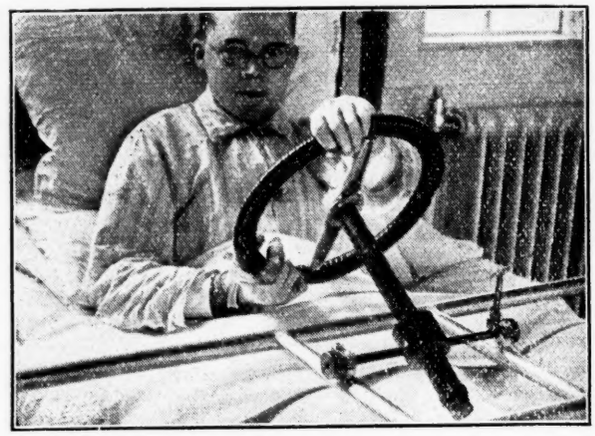
PRESERVATION OF FUNCTION IN THE BURNT HAND

Wing Commander J. C. AINSWORTH-DAVIS, M.D., F.R.C.S., medical officer in charge of the surgical division of an R.A.F. general hospital incorporating a burns centre, writes:

The optimum position of the arm and hand following aircraft burns has been concisely laid down by Mr. A. H. McIndoe, consultant in plastic surgery to the Royal Air Force, as: (1) elevation of the whole arm; (2) 30 degrees extension at the wrist-joint; (3) flexion at the metacarpo-phalangeal joints varying in degree from slight at the second to marked at the fifth; (4) mid-flexion at all interphalangeal joints; (5) adduction of the extended thumb so that the tip of the thumb and the index finger are almost in contact. Failure to maintain this functional "position of grasp," together with adequate movement of all the joints, can result in the condition of frozen claw-hand, characterized by hyperextension of the fingers at the metacarpo-phalangeal joints with acute flexion at the interphalangeal joints. Once this deformity has been acquired it is a matter of extreme difficulty, if not of impossibility, to establish normal movements in the later stages of healing.

Except where tendons are badly exposed or joints are opened as the result of burning, movements can be carried out from the very beginning, particularly when the saline-bath treatment is used or, in cases with concomitant injuries such as a fractured femur, that of the Bunyan-Stallard envelope. By either method movements are painless and the danger of "freezing" is removed. While the hand and fingers are raw these movements should not be excessive, but be limited to what can be voluntarily accomplished in the bath or bag twice or three times a day. As healing progresses, however, the frequency and scope of movement are increased, and a series of regulated and active exercises is begun. For this purpose many devices have been suggested from malleable metal splints, for position, to the grasping of a small rubber ball for movements. The more the patient's co-operation and interest can be obtained the quicker and better will be the ultimate result; and with this object in view there has been constructed in our workshops the following apparatus, which combines functionally correct movements and position and a certain novelty that the patient appears to enjoy. The idea was suggested to me while driving my car and observing my hands, which, if only the steering-wheel had been thicker, would automatically have assumed the optimum position already described.

The apparatus consists of a portable metal frame which will fit over a bed and which carries a thick motor-car steering wheel, adjustable as regards resistance to movement and the angle of the steering column. A varying angle is of importance, so that the wheel can be adapted to a patient lying down during the early treatment of his burnt hand or sitting up in the later stages. Adjustment is made by tightening the two knurled nuts screwed on the end of the two shafts which carry the housing. Further locking can be effected by tightening the nuts of the bearings which carry the whole apparatus, for which a box spanner is provided. The degree of resistance can be varied, according to the stage of convalescence of the patient, by an adjustable knurled nut at the base of the steering column. After necessary adjustment has been made, an additional knurled locking nut is provided to prevent the adjusting nut from tightening or easing off. Locking is effected by gripping the adjusting nut and screwing the locking nut up to the face of the former as tightly as possible.



A recording apparatus, not shown in the figure, is provided in order to keep an accurate account of the number of revolutions completed in each direction.

The accompanying photograph illustrates an airman convalescing from severe third-degree burns of both hands, and indicates the movements which must be carried out in order to produce a full functional result. Treatments are prescribed three times a day, the number of revolutions in both directions and the degree of resistance being governed by the general condition of the patient and the stage of healing of his burns.

My thanks are due to Air Marshal Sir Harold E. Whittingham, Director-General of the R.A.F. Medical Services, for permission to publish this note; to Mr. A. H. McIndoe for his approval of the idea and his constant encouragement; to Wing Commander Harrison for permission to construct the apparatus in his workshops; and to Sergeant Ince for its manufacture.

SULPHADIAZINE

Charles F. Thackray Ltd. inform us that sulphadiazine (Lederle) is now available in this country. We have made several editorial references to this new sulphonamide compound (see particularly *B.M.J.*, Jan. 17, 1942, p. 76). It has a full range of therapeutic activity, and extensive studies in the U.S.A. have shown particularly that it is fully effective in pneumonia. Considerably higher blood concentrations are attained with a given dosage than with other sulphonamides, and the degree of acetylation is small. Perhaps its most important advantage is low toxicity: according to existing information, cyanosis is never produced, and nausea and vomiting are rare.

The availability of sulphaguanidine (Lederle) is also announced. This is a compound much of which is not absorbed, and it is therefore used only for its effect in the bowel. The principal indications are bacillary dysentery (see *B.M.J.*, Oct. 11, 1941, p. 514) and prophylaxis before operations on the colon.

NEW VITAMIN K PREPARATION

Roche Products Ltd. have introduced a new synthetic water-soluble vitamin K preparation. "Synkavit" (the tetra-sodium salt of 2-methyl-1:4-naphtho-hydroquinone diphosphate) is available in 10-mg. tablets for oral administration, or in ampoules (10 mg./c.cm.) for intramuscular or intravenous injection. Its use is suggested in conditions in which the prothrombin level has been lowered by failure to absorb vitamin K, as in haemorrhage after obstructive jaundice, and in neonatal haemorrhage. An injection of 10 mg. daily should bring the prothrombin level back to normal within a few days. The manufacturers claim that oral administration is effective without the use of bile salts, which suggests its use orally in obstructive jaundice, though clinical trials under such conditions have not been very extensive. Since the causes of haemorrhage are numerous, the use of synkavit should be guided by the prothrombin level until some simpler means of estimating vitamin K deficiency is found.

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REFERRED PAIN

The problem why pain arising from a diseased viscus is felt at a distance has long engrossed thoughtful clinicians, and has been the subject of much controversy since Mackenzie[1] developed from the ideas of Sturge and Ross his well-known conception of referred pain. Mackenzie observed that the viscera are themselves insensitive; yet he believed that in certain circumstances impulses might arise from them and, passing up afferent nerves running with the sympathetic to the posterior root, activate in the spinal cord motor nerves, running to somatic muscles, and the central connexions of true sensory nerves from skin and muscle, so that impulses from these structures passed more easily to the sensorium, where they were recorded as pain. These visceromotor and viscerosensory reflexes, as he called them, Mackenzie held to explain the chief phenomena of referred pain in visceral disease.

Recently G. W. Theobald[2] has put forward a new hypothesis largely on the basis of observations on the uterus. He has shown that when a stick of silver nitrate is applied to the cervix uteri pain begins within five minutes and is referred to the back, the iliac crests, and the inner side of the thighs, a region of skin innervated by the first lumbar nerve. Iliac pain is relieved temporarily by anaesthetizing the subcutaneous tissue at the points where the skin supply passes in close relation to the bone, and abdominal pain by anaesthetizing the ilio-inguinal and ilio-hypogastric nerves. The rhythmic pain of dysmenorrhoea may be abolished by these procedures. Labour pain behaves similarly, though the relief of abdominal pain by local anaesthesia accentuates the iliac pain, and if this is then abolished by local anaesthesia pain becomes noticeable in the region of the inguinal canal and mons veneris.

Thus far these results are in accord with Mackenzie's hypothesis, though it is to be noted that there is not yet complete agreement as to the extent to which pain arising from visceral disease may be relieved by anaesthetizing the skin in the territory of reference; F. R. Brown,[3] for instance, failed to relieve the abdominal pain of a strangulated femoral hernia by anaesthetizing the abdominal wall. Theobald is greatly impressed with the relation between dysmenorrhoea and the social environment, and with the fact that, if silver nitrate is applied to the cervix under a general anaesthetic, the subsequent pain is very greatly diminished. These facts suggest to Theobald that the brain rather than the spinal cord is the structure in which take place the events responsible for the peculiar features of referred pain, and he adduces many observations in support of this view. Thus in concealed accidental haemorrhage, where the pain is intense, the abdomen becomes board-like and the thighs are flexed; if the ilio-hypogastric and ilio-inguinal nerves are anaesthetized both pain and abdominal rigidity disappear. He holds that it is impossible for the lower six thoracic nerves to be stimulated by a focus of irritation in the first lumbar segment, as Mackenzie's hypothesis would require, and believes, therefore, that the visceromotor, like the viscerosensory, reflex involves a co-ordinating centre in the brain. The frequent wide reference of pain—Theobald's examples include reference to the tip of the penis from injury of a metatarso-phalangeal joint and to the arm from a septic tooth—is also held to denote cerebral rather than spinal activity. He supposes, therefore, that in visceral disease impulses pass along sensory somatic nerves travelling in the sympathetic pathways to the pain apperceptor in the brain, where cells are segmentally arranged. The arrival of these impulses lowers the threshold to perception of impulses normally passing from the parietes of the body, so that these impulses contribute largely to the sensation of pain; further, not only impulses from the same segment but those from neighbouring cranial and somatic pathways may be similarly facilitated. Theobald's hypothesis differs from Mackenzie's in supposing that the impulses from viscera and from skin travel separately in the cord to the sensorium, and that the visceromotor reflex arc includes the brain. There is as yet no incontrovertible evidence as to the sensory paths, though such may ultimately be forthcoming as a result of studying the phenomena of visceral disease in patients with lesions of the spinal cord. But it seems highly unlikely that the motor reflex should be other than spinal, and it is to be noted that Lewis and Kellgren[4] obtained contraction of the rectus abdominis by stimulating the duodenal mesentery in decapitated cats. But every clinician will agree that the activities of the mind are of extreme importance in modifying the appreciation of pain.

The casual reader is apt to be confused by the different theories of the origin of referred pain, and it may help to summarize briefly some of the more important points. In most instances of visceral disease there is still considerable doubt where the pain primarily arises. Lennander[5] showed many years ago that most of the hollow abdominal viscera are insensitive to direct mechanical and thermal stimulation; he supposed that pain did not arise directly from such organs but from adjacent and attached sensitive structures such as the mesentery. In agreement with this Lewis and Kellgren obtained reflex contraction of the rectus abdominis of the spinal cat by pinching the duodenal mesentery but not by pinching the duodenum itself. Morley and others consider that poorly localized pain does arise from viscera but that this is not accompanied by muscular rigidity and tenderness, which are the result of stimulation of somatic nerves—e.g., in the peritoneum. More, and more careful, observations are needed before it can finally be stated from what viscera and in what circumstances pain can arise directly. The extent to which impulses from the parietes contribute to the origin of visceral pain is again not finally settled, and we may instance the controversy between Morley,[6] who finds that anaesthetizing the skin overlying the shoulder reduces the pain elicited by stimulating the under surface of the diaphragm, and Woollard, Carmichael, and Roberts,[7] who obtain no effect by similar procedure on the pain produced by phrenic crush, noting, however, that Morley is more nearly reproducing what may be supposed to happen in visceral disease. Finally, we come to the curious distribution of visceral pain in territories which, while usually following segmental lines, are distinct from that occupied by the diseased viscera. Kellgren[8] and Lewis and Kellgren have shown that this property is not peculiar to pain arising from visceral disease but is shared by somatic pain arising from deep structures. It is thus the depth of a structure from the surface that determines whether pain is felt locally or segmentally and at a distance. Although sensory nerves from the viscera

1 *Symptoms and their Interpretation*, 2nd ed., London, 1912.
2 *Referred Pain. A New Hypothesis*, Ceylon, 1941.
3 *British Medical Journal*, 1942, **1**, 543.
4 *Clin. Sci.*, 1939, **4**, 47.
5 *Observations on the Sensibility of the Abdominal Cavity*, London, 1903.
6 *Abdominal Pain*, Edinburgh, 1931.
7 *Lancet*, 1932, **1**, 337.
8 *Clin. Sci.*, 1939, **4**, 35.

travel in the sympathetic pathway they yet belong to the posterior root system, as do the other sensory nerves in the body. The accurate correspondence between the site of stimulation and the location of the sensation by the subject is a property of the superficial structures, where it obviously serves an important function. The location of deep pain no doubt depends on the paths travelled in the central nervous system by the impulses, and these seem to follow a rough segmental pattern which is probably of very ancient origin. That ontogeny repeats phylogeny is an old biological principle, and thus Brown's point that a guide to the site of reference of visceral pain may be obtained by considering the embryological origin of the viscus is in agreement with this view.

CAN VITAMINS HELP THE WORKER?

The industrial surge in the United States brought about by the rearmament programme, the Lease-Lend Plan, and finally by the entry of that country into the war has greatly sharpened American interest in matters of industrial efficiency. A short cut to the solution of this complicated problem is being offered by numerous commercial concerns interested in the sale of vitamin preparations, and all the blandishments of super-salesmanship are exerted on employers of labour in America urging them to distribute broadcast to all and sundry various vitamin concentrates or pills. The promised material reward is high: increased efficiency of the workman and a decrease in absenteeism. To this, it is suggested, may be added the moral satisfaction of helping the State and contributing to the final victory. A committee set up by the Council on Foods and Nutrition and the Council on Industrial Health of the American Medical Association[1] has recently voiced its reasoned disapproval of such mass indiscriminate administration of vitamins. This disapproval is based on carefully sifted scientific evidence, and the common-sense views of the committee are, no doubt, equally valid on both sides of the Atlantic. Attempts at commercial distribution of vitamins to industrial workers have not been lacking in this country, though probably on a much less ambitious scale than in the United States, and it might be well to review here briefly the basis of the opinions expressed by the American Medical Association. The scheme was condemned because it was considered irrational from a therapeutic point of view, unwise nutritionally (because vitamins cannot take the place of natural foods), and, finally, uneconomical, as a good diet can provide all that vitamin preparations can offer and much else besides.

Apart from a volume of vague statements, mostly of the testimonial type, put forward by the promoters of vitamin preparations, little scientific work is to hand in the United States on the value of the administration of vitamins in industry. The evidence, mostly relating to vitamins A and D in their effects on respiratory diseases and retinal fatigue, is considered inconclusive by the American committee, which suggests that firms apparently willing to spend large sums of money on the wholesale provision of vitamin pills to employees would render valuable public service if they supported proper research into what is in effect the problem of subclinical deficiencies among apparently normal people. Strangely enough—and this shows the effects of high-pressure salesmanship—some commercial undertakings in the States which were considering "vitamin health control" were at the same time supplying meals to their workers; no attention was, however, paid to the nutritive value of the food provided, which was, as a rule, unsatisfactory. Recent work in the United States[2] has shown that with a really adequate diet, such as a good U.S. Army ration, further supplements of vitamins serve no useful purpose in promoting physiological efficiency. On the other hand, there is evidence to show that industrial efficiency is affected by the so-called hunger contractions of the stomach, and that it is related to the concentration of the circulating blood sugar.[3] [4] Fatigue can apparently be alleviated by between-meal feedings of the type of the Oslo breakfast, but it is, to say the least, doubtful whether this could be achieved by vitamin pills alone. In short, the feeling of the American committee is that natural foods rather than vitamin pills should be used to remedy any dietary inadequacies of industrial workers.

There is yet another aspect of such suggested vitamin feeding which deserves serious consideration. Certain distributors of vitamin preparations in America advocate the administration of vitamin C as a prophylactic measure against poisoning by metals, organic solvents, phenol, and so on. The scientific basis for such practice is still quite inadequate, and its adoption might well create in the mind of the employer a sense of false security and lead to a relaxation of the proper safety measures. All this vitamin propaganda is indeed leading the unwary, or perhaps the disingenuous, to attempt to solve problems of overwork under insanitary conditions by a vitamin pill. The pronouncement of the American Medical Association has certainly come none too soon.

What of the problem here? The pressure of trade interests and the danger of commercial exploitation are not so great as across the water. On the other hand, food is rationed and some protective foods are scarce. The country has been at war for nearly three years, and throughout them the strain of long hours in industry has had to be endured. Would under such circumstances a "vitamin therapy" be useful? Two observations under war conditions—one from Germany,[5] the other from Scotland[6]—show that the health of children and adolescents may be improved by the administration of vitamin C, and that notably the resistance to infection in general is increased and the duration of respiratory infection shortened. The German observations are particularly striking because of their enormous scope—they include over 2 million school children. It is noteworthy that this vitamin treatment is looked upon there only as an emergency prophylactic measure to be replaced as soon as circumstances permit by a balanced complete diet of natural foodstuffs.

It does not follow that adults in industry would derive a similar benefit from vitamin supplements. As a matter of fact the development in this country of works canteens, justly praised by the American committee, has brought about much improvement in the nutrition of the worker, which is probably better now than it was before the war. The maintenance of adequate nutrition needed for high industrial efficiency will best be achieved by well-designed canteen meals prepared according to modern nutritional knowledge. All the essentials of a balanced diet are available in sufficient quantities, and every effort should be made to avoid unnecessary losses of nutrients in cooking and storage. A carefully planned scientific inquiry into the value of vitamin additions superimposed on such meals would be both instructive and valuable. Any attempt at indiscriminate wholesale distribution of vitamins without first ensuring the full utilization of existing natural foods must, however, be condemned as wasteful and unprofitable.

1 *J. Amer. med. Ass.*, 1942, **118**, 618.

2 *J. Nutrit.*, 1942, **23**, 259.
3 Haggard, H. W., and Greenberg, L. A., *Diet and Physical Efficiency*. New Haven, Conn.: Yale University Press, 1935.
4 *J. Amer. diet. Ass.*, 1941, **17**, 753.
5 *Ernährung*, 1941, **6**, 269.
6 *J. Hyg.*, Camb., 1942, **42**, 1.

HEAT AND COLD IN INJURY

Body cooling, we read in Talbott's review of the subject,[1] was used by the ingenious Mr. Weeks in the eighteenth century to effect rapid recoveries from innumerable alcoholic intoxications, but it is only since 1938 that "hypothermia" has been used for the treatment of cancer, leukaemia, and other conditions[2]; even now it is still only in the experimental stage. The local application of heat and cold is as ancient as medicine itself. It is surprising to find that we know, on the whole, more of the effects of systemic heating and cooling than we do of those resulting from local application. This regrettable state has been partially remedied by the work of Allen on ligated limbs, and more recently by the observations of Brooks and Duncan[3] on skin wounds produced by intradermal turpentine or *Staph. aureus* culture. The last-named authors find (and illustrate with 12 handsome colour photographs) that after the application of heat (40° C.) for 48 hours the necrotic and inflammatory process is hastened, and that after cold (10° C.) it is very greatly retarded, appearing almost normal both grossly and histologically. As the authors stress, however, these observations are significant only when related to past or future developments: 24 hours after the discontinuance of cold it was found that the turpentine lesion, now 96 hours old, was of a size and development equal to a similarly produced lesion developing at body temperature for 24 hours. The lesion after injection of staphylococci was, if anything, larger after application of cold than if it had developed at body temperature. (A somewhat similar observation had previously been made by Allen.[4]) The suggestion is made that cold inhibits either the production of toxin by autolysis or the normal tissue response.

Brooks and Duncan point out that in surgical shock the bloodless limbs are more easily affected by surface temperature, but that, although temperature certainly has an effect on the disintegration of dead tissue, there is some doubt as to the wisdom of inhibiting an inflammatory reaction by cold application, at all events until we know more about the mode of action. On the other hand, they conclude that these results do not support the generally accepted use of the application of external heat for the prevention or treatment of surgical shock. Indeed, some recent experimental observations made in the laboratory of one of the most experienced of "shock-troopers" (Blalock and Mason[5]) led to the conclusion that in dogs shocked by bleeding or by trauma to the limbs general heating of the body reduces the survival time after a critical low blood pressure is reached, while cooling the animal increases the survival time. They point out that the opening up of the skin vessels in man increases the vessel capacity by about 500 c.cm., which in a patient with a blood volume already depleted may produce a critical collapse. In recent discussions on the crush syndrome and on shock at the Royal Society of Medicine[6 7] speakers drew attention to the danger of overheating the shocked patient. In the crush syndrome heating the necrotic muscle in the injured leg not only increases the local circulation and hence the absorption of autolytic products, but it also hastens the rate of autolysis and increases the local metabolism: refrigeration, indeed, may yet be found the local treatment of choice in such injuries. Much support for this is given by Allen's observations that both tissue necrosis after ligation of a limb and the shock ensuing on the release of the constriction are increased with heat and much diminished if the ligated limb is kept at a low temperature. His investigations on amputation for limb gangrene in arteriosclerotic and diabetic patients[8] lend considerable support to his thesis. In a limb rendered ischaemic by spasm of vessel or other vascular interference a decrease in local metabolic needs may make all the difference between survival and death of tissue. That damaged patients and damaged limbs have always been warmed is not in itself a sufficient proof of its efficacy: Allen's work appears to have a sound theoretical and experimental basis, and, furthermore, a striking clinical success. That not uncommon sight in English hospitals—the ischaemic leg of arteriosclerotic gangrene surrounded with hot-water bottles—must be banished. Distinction must be made, however, between local and general heating or cooling. There is less conclusive evidence on the value of general heating or cooling in shock. Experiments such as these, based on quantitative estimations, will doubtless tell us soon how to employ heat and cold, locally and generally, in the treatment of shock and damaged tissue.

1 *New Engl. J. Med.*, 1941, **224**, 281.
2 See leaders in *British Medical Journal*: 1940, **1**, 979; 1940, **2**, 528; 1941, **2**, 231.
3 *Ann. Surg.*, 1941, **114**, 1069.
4 *Surg. Gynec. Obstet.*, 1939, **68**, 1047.
5 *Arch. Surg.*, 1941, **42**, 1054.
6 *Proc. roy. Soc. Med.*, 1942, **35**, 321.
7 Ibid., 1942 (in the press).

VITAMIN B AND E THERAPY IN TABES

The clinical response of the tabetic to antisyphilitic treatment does not always follow the course expected by serological improvement. It has been suggested that two factors are at work in producing the syndrome. One, the infection by the *Spirochaeta pallida*, is known to be essential, though the organism is very rarely found in the spinal cord of tabetic patients. The other factor may be a food deficiency. The lesions seen in the posterior column of the spinal cord in pernicious anaemia, pellagra, alcoholism, diabetes, and beriberi have a superficial resemblance to those encountered in tabes, but unfortunately Reese and Hodgson[9] were unable to show any consistent dietary deficiency in tabetic patients. Stone[10] gave eighteen tabetic patients the vitamin B complex together with vitamin E in large doses by mouth as well as thiamine chloride in doses of 10 to 50 mg. intrathecally. He was impressed by the improvement in gait, muscle tone, strength, and co-ordination, in bladder function, and by the reduction of lightning pains and gastric crises. These results were obtained after antisyphilitic treatment had ceased to be beneficial. They were rapid and sometimes dramatic. It was Stone's impression that the results of antisyphilitic treatment were enhanced by simultaneous administration of the vitamin B complex and vitamin E. Thiamine has a "catalytic" action in the metabolism of nervous tissue, but, as Stone points out, the fact that a certain drug or combination of drugs is helpful in any condition is not in itself evidence that the condition is caused by a deficiency of this substance. The weight of this observation is enhanced by Stone's previous observations, for he has elsewhere reported[11 12 13] upon the favourable effects of administering these two vitamins in muscular dystrophies, polyneuritis, and the myatonias of childhood. Carefully controlled work in this country has failed to confirm any beneficial result in the dystrophies. Mitchell[14] has recently shown that, although he produced posterior column degeneration by dietary deficiency and prevented the degeneration by yeast, this was a deficiency not of a vitamin but of an inorganic micro-constituent of the diet, probably copper. Turning more specifically to tabes

8 *Amer. J. Surg.*, 1941, **52**, 225.
9 *Urol. cutan. Rev.*, 1939, **43**, 56.
10 *J. nerv. ment. Dis.*, 1942, **95**, 156.
11 *J. Amer. med. Ass.*, 1940, **114**, 2187.
12 *New Engl. J. Med.*, 1940, **223**, 489.
13 *J. Pediat.* (in the press).
14 *Brain*, 1941, **64**, 165.

dorsalis, there is really no evidence at all that a vitamin deficiency exists, and if vitamins must be used in treatment they should be used empirically and without rationalization. In any case, the course of the disease is so insidious and so variable that therapeutic claims should be made with the utmost caution. Claims for the vitamin are yet far from proven.

THE RHEUMATIC LUNG

The nature of so-called rheumatic pneumonia has long been a battle-ground for pathologists, and the latest entrants into the lists, Epstein and Greenspan,[1] are fortunate (pathologically speaking) in having had the opportunity to study the lungs of 45 patients who died of acute rheumatic fever, 14 of whom succumbed to their first attack. These authors conclude that a characteristic series of pulmonary changes occur in acute rheumatic fever, and their findings correspond with those previously published by Masson, Riopelle, and Martin[2] in 1937, and later confirmed by Hadfield.[3] Epstein and Greenspan, however, have been able to describe the evolution of these pulmonary changes more fully because their material was obtained at different stages of the disease. They found that the earliest alteration was oedema, closely followed by capillary congestion and diapedesis of erythrocytes into the alveoli. Later, these become packed with large mononuclear cells, which appear to ingest the erythrocytes, and hyaline membranes are seen on the walls of the respiratory bronchioles and alveolar ducts in 50% of the cases. Macroscopically there are patchy or confluent areas of dark-red consolidation. The next stage consists of fibrosis and organization with thickening of the smaller arteries, and these changes become more extensive as the disease progresses. The lungs of those patients who had old rheumatic disease with cardiac damage showed advanced degeneration of the pulmonary artery and its branches. There were intimal proliferation, perivascular infiltration, and degeneration and vacuolation of the media, progressing to thickening and finally obliteration. Aschoff's nodes were not seen, and although they have been described in the lung by Fraser,[4] this has not been confirmed by other workers; Hadfield points out that they would be difficult to identify in lung tissue, especially in the presence of a heavy mononuclear infiltration. Hyaline membranes are found in the lungs in a variety of conditions, including influenzal pneumonia and the pneumonia of infants due to the aspiration of amniotic contents. Hadfield observed that all such conditions had two factors in common: severe inspiratory dyspnoea, and albuminous exudate in the finer airways. The membranes are probably formed by the exudate, which is forced against the walls of the air spaces by an increase of pressure within them; this in turn is due to partial obstruction of the airways by secretion.

Thus it seems that a clear picture can now be drawn of the pulmonary changes in acute rheumatism: alveolitis followed by haemorrhagic consolidation, mononuclear infiltration, the formation of hyaline membranes, and, finally, organization and fibrosis. There is also a progressive arterial degeneration of the rheumatic type. The pulmonary damage seems to be a part of the rheumatic process and not secondary to cardiac failure, though the dyspnoea associated with this condition may be cardiac in origin, for Hadfield noted that those patients who showed signs of lung involvement but recovered were also remarkably free from dyspnoea.

1 *Arch. intern. Med.*, 1941, **68**, 1074.
2 *Ann. Anat. path.*, 1937, **14**, 359.
3 *Lancet*, 1938, **2**, 710.
4 Ibid., 1930, **1**, 70.

CABBAGE AND THE THYROID

The association between cabbages and thyroid glands was first demonstrated experimentally by Chesney, Clawson, and Webster[1] in 1928. They found that rabbits fed on a high-cabbage diet developed hyperplastic goitrous thyroids. This observation was confirmed in the U.S.A., in this country, and in India. Marine and his colleagues[2] concluded that the responsible agents were organic cyanides, known to be present in cabbage and in other members of the Brassica family having similar goitrogenic activity. They showed that goitre could be produced in rabbits by injecting pure organic cyanides, and suggested that the lowering of oxidative processes in the tissues caused the thyroid to increase its activity, resulting in a relative iodine deficiency. The hyperplastic glands in the experimental animals responded to administration of iodine. There the matter has rested for some time, but now our knowledge of the mechanism has been extended by a group of Australian workers. Kennedy and Purves[3] have shown that the addition of various Brassica seeds (such as rape, swede, or turnip seed) to the normal diet of rats increases their thyroid weight by as much as 300%, and that the glands become hyperplastic just as do those of rabbits fed on cabbage. This rapid proliferation of the gland takes place during the second and third weeks on the Brassica-containing diet: after this the only increase in thyroid weight is proportional to increase of body weight. Examination of the other endocrine glands in the treated rats showed hypertrophy of the adrenal cortex, delay in development of the ovary, and histological changes in the pituitary. This last finding suggested that the thyroid effects were secondary to changes in the anterior pituitary and was more carefully investigated by Griesbach.[4] He finds that there is a notable increase in the number and size of the basophil cells. This change starts when the thyroid hyperplasia starts, reaches a maximum at the same time, and reverts to a more normal condition coincidently with the reappearance of colloid in the thyroid. There is other evidence for basophil activity besides that afforded by the increased number of cells, the basophils becoming hyalinized and vacuolated, with hypertrophy of the Golgi apparatus and formation of "signet-ring" cells. Experiments on hypophysectomized rats[5] clinch the evidence that it is the pituitary which is responsible for the changes in the thyroid. The goitrogenic diet does not produce any thyroid hyperplasia in these animals. Further, if rats in which hyperplasia is already present are hypophysectomized the hyperplasia rapidly regresses in spite of continued feeding of the Brassica seeds, and it is also noticed that colloid formation and storage take place. This proves that this type of thyroid hyperplasia requires the mediation of the pituitary gland. It may be added that there is no available evidence that this effect of members of the Brassica family is of any significance in the amounts present in human diets. Certainly the devotion to cabbage shown by the British people (who have for generations regularly eaten large quantities of the olive-coloured, soggy mess constituting the less worthy half of "two veg.") should have provided some evidence if this were so.

Prof. H. R. Dean has been re-elected Chairman of the Council of the Imperial Cancer Research Fund for the year 1942-3 and Sir Cuthbert Wallace, Bt., Vice-Chairman for the same period. The Council has re-elected Dr. L. Foulds as Elizabeth Wills Allen Fellow and Dr. R. J. Ludford as Alice Memorial Fellow.

1 *Johns Hopk. Hosp. Bull.*, 1928, **43**, 261.
2 *J. exp. Med.*, 1933, **57**, 121.
3 *Brit. J. exp. Path.*, 1941, **22**, 241.
4 Ibid., 245.
5 Ibid., 249.

War Surgery of the Extremities

This is one of a short series of articles based on lectures given at the British Postgraduate Medical School, Hammersmith

THE MANAGEMENT OF BURNS

BY

H. J. B. ATKINS, M.D., M.Ch., F.R.C.S.

(*Concluded from p.* 705)

If we turn now to the local treatment of burns we must consider the three degrees separately, as the problem is different for each degree.

First-degree Burns

First-degree burns are of little consequence. Burnt patients tell me that compresses of sodium bicarbonate ease the pain in a remarkable way. Sometimes the skin feels tight and leathery 24 hours after a first-degree burn of the face, but an emollient such as lanolin or ung. aq. ros. will afford considerable relief and enable the patient to talk and give free play to his facial muscles without discomfort.

Second-degree Burns

Second-degree burns constitute an interesting and as yet unsettled problem of therapeutics which we must examine with the greatest care. Just as since the last war there have been two schools of thought in regard to the treatment of infected wounds—namely, those who would encase these wounds in a plaster cast and those who would irrigate them by means of Carrel-Dakin's tubes—so in this war in regard to second-degree burns there are those who aim at producing a crust over the burnt area and those who prefer some form of wet dressing or irrigation. Before further inquiry into the respective merits of these two methods of treatment one fact can be stated categorically, and that is that the introduction of coagulation methods has halved the mortality from second-degree burns as a whole. If the wet methods are to be preferred it must first be shown that the mortality from second-degree burns is as low with these methods as after coagulation methods, or, alternatively, that they enable function to be better preserved in a part where preservation of function is a factor almost as important as the saving of life—namely, in burns of the hands.

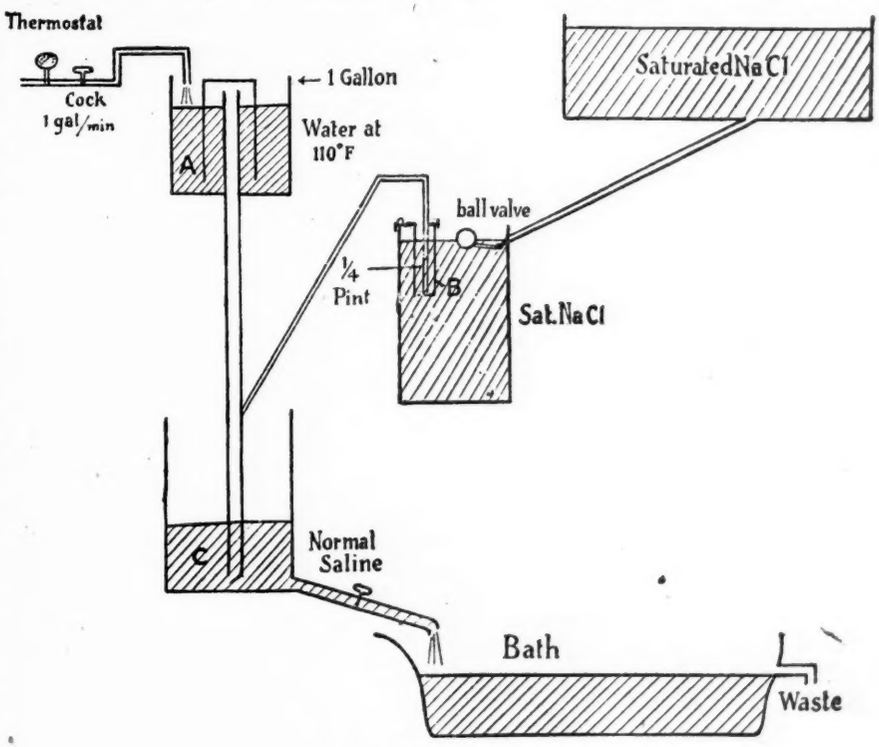
With either method I believe it is essential to give the patient a general anaesthetic and to clean the burn thoroughly as a preliminary. In coagulation methods this cleansing is of paramount importance and cannot, in my opinion, be done thoroughly unless a general anaesthetic is used. Advocates of the wet methods claim that this preliminary cleansing is not so essential, and even that an anaesthetic can be dispensed with altogether if their method is adopted. If these claims could be substantiated it would be a formidable argument in favour of the wet methods in that the anaesthetic must be responsible for a proportion of the mortality from these cases. So far as my experience goes, however, I do not believe that this claim is valid, and certain cases treated by the wet method have suggested to me that cleansing is equally as important here as in the coagulation methods. The cleansing must be done methodically and carefully. All dead skin is removed and the part carefully brushed with sponges soaked in saline. Particular attention is paid to the edges of the burn, where the epidermis may be partially separated and, unless it is removed from the underlying dermis, will be raised subsequently by fluid exudate which damages the coagulum. In small second-degree burns with a limited area of vesication the part is carefully sterilized with spirit, the blister pricked with a sterile needle, and a sterile dressing bandaged on firmly. Epithelization proceeds rapidly and satisfactorily under this natural covering.

Coagulation

If a coagulation method is elected there is a wide choice of coagulants, ranging from tannic acid in various strengths to silver nitrate or the triple dye (crystal violet 1:400, brilliant green 1:400, acriflavine 1:1,000). I have found that the most satisfactory combination is gentian violet 1%, tannic acid 10%, and silver nitrate 10%. It is important that these substances should be swabbed on to the area one after the other without waiting for the previous one to dry. In this way a firm, pliable, and adherent coagulum is formed. If the part is dried between each application a very thick coagulum results, which is never necessary and in some situations is undesirable or even disastrous. If the burn is a circumferential one, then the coagulum should be split with a sharp scalpel down each side as soon as it has set, to allow for the swelling of the part from reactionary oedema. The ribbon so formed may be coagulated in 48 hours. Each 24 hours the edge of the coagulum is painted with gentian violet, and any cracks which may appear are similarly treated. If this method is employed on the hands or fingers early active movements are possible, and after 48 hours must be insisted upon. These movements are at first restricted, which is not undesirable; later they become quite free. Pledgets of cotton-wool impregnated with tannic jelly or vaseline are inserted into the webs of the fingers to prevent the latter sticking together.

Saline

If a wet method is preferred there is an equally wide choice. There is the tulle gras, sulphonamide, and saline compress method, the saline bath, or the Bunyan bag. In the first of these tulle gras is applied to the raw surface; it protects this



APPARATUS FOR SALINE BATH

Each minute the tank A becomes filled with water at 110° F. When the fluid level reaches the outlet pipe the whole gallon is siphoned into container C, drawing with it 1/4 pint of saturated salt solution from container B. Container B is thus momentarily emptied, but refills itself through its floor, which is made of fine-mesh wire gauze.

and renders dressings comparatively painless. Tulle gras is a wide-mesh net impregnated with a vaseline base to which balsam of tolu and halibut-liver oil are added. Some patients are sensitive to halibut-liver oil, and the tulle gras sets up intense itching. If this is so, specially prepared tulle gras must be used from which the halibut-liver oil has been omitted. A sulphonamide powder is sprinkled on to the tulle gras and saline compresses are applied. The compresses are kept continually moistened by means of Carrel-Dakin's tubes or by pouring on normal saline from an undine each half-hour. Twice a day the saline compresses are changed, or, in the case of a limb, they may be floated off in a saline bath. The tulle gras can be left unchanged for 3 or 4 days, but some authorities advise that it should be changed after 48 hours. In a second-degree burn of the face which I treated by this method the tulle gras was left on for a week without ill effect, the area healing rapidly and satisfactorily in ten days. In the case of burns of the fingers and hands early active movements in the bath are essential from the first.

If the burn is that of a limb the Bunyan bag may be used. This is a watertight bag which encloses the part. It is provided with one or more inlet and outlet tubes through which intermittent irrigation of the limb may be undertaken. Various strengths of electrolytic hypochlorite solution are used for this purpose, and are credited with some particular virtue. In between irrigations the bag is loosely filled with air or oxygen and free exudation from the burnt surface is allowed. At certain centres devoted to the treatment of burns, saline baths are available. These are full-sized baths (see Fig.) in which the patient sits or lies and through which a constant stream of warm normal saline is kept flowing. The patient may remain in the bath for hours at a time, and when he comes out and returns to bed the burn is kept moist with saline compresses. Where these special baths are not available a satisfactory substitute can be made by adding a gallon of brine to 32 gallons of warm water in an ordinary bath and keeping this up to body temperature by the addition of hot normal saline.

If the wet method be chosen I should use the tulle gras, sulphonamide, and saline compress method for burns of the face or small burns of the trunk or limbs; the Bunyan bag for extensive burns of the limbs; and the saline bath for extensive burns of the trunk.

The Choice

Now let us make up our minds whether in regard to second-degree burns we are going to be "dry-" or "wet-bobs," or whether we are going to preserve a watchful impartiality. I can only give you my own experience in this matter. I was in the habit of coagulating all second-degree burns by the method I have described above when *ex-cathedra* statements shook my firm beliefs to the very roots. I was told that tanning hands, faces, and even feet would produce deformities and disasters for which I should be held responsible. At meetings of Royal Societies photographs of hands distorted into grotesque shapes were flashed upon the screen over a caption such as "The Results of Tanning." Now, I was determined to keep to this method of proved value so far as saving life was concerned and to change over to other methods if and when I came across the disasters which were attributed to it. As it turned out, I went on for so long without meeting any of these evil effects that after I had treated thirty second-degree burns of the fingers and hands by the method of coagulation with the happiest consequences, I resolved to try out the wet methods without waiting any longer. I can only suppose that the disasters following the tanning of fingers and hands arise from the use of heavy coagula or from neglect of active movements.

Comparing the two methods, I have come to some tentative conclusions. I believe that coagulation therapy is to be preferred for second-degree burns except under certain circumstances in burns of the hands and eyelids. The coagulation method is more effective in overcoming shock; it is attended by less pain, particularly between the second and fourth days, and it involves far less nursing attention. On the other hand, the effects of misapplied tannic therapy may well be disastrous. The wet methods, especially when applied to the fingers and hands, allow restoration of full movement in about half the time required with the tannic methods. The technique is simple and fool-proof, and disasters in regard to loss of function cannot occur. Shock, however, is greater, pain may sometimes though not always be considerable, and the calls on the nursing staff are more arduous. Further, the wet methods do not protect the patient from the effects of sepsis. One of my patients with burns of the forearm and hands treated by tulle gras, sulphonamide, and saline compresses had rigors on the second and third days; and another, similarly treated, developed a virulent and painful lymphangitis and axillary adenitis with high temperature which caused considerable anxiety.

How can we formulate a logical plan of treatment in the light of these opinions? I believe that where a second-degree burn is of such an extent that shock is a danger to life the whole of that burn, even though it involves the fingers and hands, should be tanned. In the case of burns involving only the fingers and hands, if adequate theatre accommodation and skilled surgeons are available these are best treated by coagulation, particularly where many casualties have to be cared for by an insufficient number of nurses. If there is any doubt about the perfection of débridement, if the burn is treated after six hours, and if a full complement of nurses is available, then one of the wet methods is to be preferred.

There remain to be considered the first-aid treatment of second-degree burns and the treatment of a second-degree burn which has been tanned and has become septic under the tan.

First Aid

It was not possible to consider first-aid treatment of these burns in their rightful place because the problems involved are thought to be governed to a certain extent by the method of treatment which is to be adopted finally. In my opinion this is not so. I do not believe that the first-aid treatment, whether it be by means of saline or bicarbonate compresses, or by tannic jelly, makes any difference to the ease with which either coagulation or wet methods may be applied subsequently. The question has been raised particularly in regard to tannic jellies. It was felt that the coagulation which these jellies produced might jeopardize the extent of the subsequent débridement. Theoretically, indeed, it might, but in practice I have not found this to be so. I do not believe that tannic jelly is to be condemned on this account, but it has the disadvantage that it may make the diagnosis of a second-degree burn from a third-degree burn a very difficult matter, and for this reason I should prefer saline or bicarbonate compresses as a first-aid treatment for the majority of burns. Where, however, the burn is of great extent and the patient is in considerable pain, tannic jelly is the most comforting preparation, and its effect in partially controlling fluid loss outweighs any disadvantage it might have in other respects.

Sepsis

If a second-degree burn that has been tanned becomes septic it is converted into a third-degree burn because the septic process involves the true dermis. The treatment therefore conforms to that presently to be described for third-degree burns. Ideally, the crust elevated by a purulent exudate should be removed forthwith and the treatment for third-degree burns started. It must not be thought, however, that this "decrustation" will diminish the patient's general reaction to sepsis; it is not, in fact, tantamount to opening an abscess, and it is performed only so that the infected surface may receive adequate treatment. Once the crust is removed a patient may be more uncomfortable than before, and, in very extensive burns which have become septic, unless adequate facilities for immersing the patient in a saline bath are available, it may be desirable to leave the coagulation *in situ* and move him in that condition as soon as possible to a centre with such facilities.

Special Sites

Certain sites deserve special mention. When the face is burnt, the eyes, eyelids, and ears should be protected by cotton-wool plugs smeared in vaseline before tanning is carried out. Adults should be warned not to touch the area, and children should have their hands tied. Burns of the eyes are apt to be followed by adhesions of the lids to the conjunctivae (symblepharon) and by adhesions of the lids to each other (ankyloblepharon) The eyes are washed out many times daily, and once a day a glass rod covered with vaseline is passed under each lid to the limit of the conjunctival reflections. If the mucous membrane of the

nose is affected, this should be syringed with 1.5% saline to which adrenaline solution (1:1,000) has been added in the proportion of 2 minims to each ounce of saline. Burns of the perineum are troublesome conditions to nurse. Children are best treated in a Bryant suspension. Adults should have the legs splinted in abduction. A daily enema will usually avoid soiling the coagulum. When a patient is badly burnt on both surfaces of the body it will be impossible to prevent him from lying on some part of the burnt area. If this cannot be avoided clean towels should be laid over the sheets, the mackintosh draw-sheet being dispensed with; otherwise perspiration will render the coagulum sodden.

Third-degree Burns

A third-degree burn is diagnosed when there is obvious destruction of tissue, when there is charring, or by a peculiar white escharotic appearance of the burnt surface. Where a large area of second-degree burn has a few small areas of third-degree burn scattered about in its midst, the burn can be dealt with as if it were all of second degree. Thus if the indications for tanning obtain it may be tanned, when it will be found that the greater part of the area will heal successfully under the tan and the few areas of third-degree burn may require compressing and even grafting when the coagulum has separated. Apart from this special type of mixed burn, however, third-degree burns should be treated by one of the wet methods described above. The paramount consideration in a third-degree burn is to prevent scarring and contractures, and this can be done only by skin-grafting the area at the earliest possible opportunity. Skin-grafts take successfully when the granulations are flat, pink, and painless; treatment is therefore directed to achieving this end with the least possible delay. Saline compresses or saline baths are incomparably the best methods of treating these granulations. If a third-degree burn is inadvertently tanned because it was wrongly diagnosed as a second-degree burn no very great harm is done, because the crust will come away as soon as the slough begins to separate and the saline treatment can be instituted. The prognosis as to life in a third-degree burn is quite good, but the prognosis as to function, especially in the case of burnt hands, is most unsatisfactory. Destruction or spasm of the digital vessels causes ischaemic changes to take place in the pulps of the fingers, so that these become glossy, wasted, atrophic, or even gangrenous. Joints tend to ankylose, and the most desperate endeavours to keep movements going may be doomed to failure.

Finally a word about the special centres for the treatment of burns. The results achieved in these centres, especially in third-degree burns, are excellent. The facilities for giving saline baths and the possibilities of expert plastic treatment make it incumbent upon us to utilize the centres to the best of our ability. It is in such organizations that advances can be made by a statistical study, which is impossible in all but the largest general hospitals.

In a statement on the Government's post-war hospital policy made last October, the Minister of Health announced his intention of initiating surveys of the hospital services in order to obtain the information required as a basis for future planning. A survey is already in progress in London and the surrounding area, and the Minister has now accepted invitations from the Lancashire Committee of Investigation into Hospitals Regionalization, and from the Cheshire and North Wales Hospitals Co-ordination Committee, to undertake a survey in the North-Western area. The Minister has appointed Mr. E. Rock Carling, F.R.C.S., and Dr. T. S. McIntosh to carry out the survey. They have been asked: "To survey the hospitals (other than mental hospitals and mental deficiency institutions) in the geographical counties of Lancashire and Cheshire and in North Wales and other neighbouring areas which look to those counties for hospital treatment; and having regard to the information thus obtained, and to the general principles of post-war hospital policy laid down by the Minister of Health in the House of Commons on Oct. 9, 1941, to advise the Minister what areas would appropriately be served by a hospital system centred on the teaching hospitals of Liverpool and Manchester, and what modifications or extensions of the existing hospital facilities would be necessary or desirable to give effect to that policy." Although the survey will be primarily concerned with the areas specified, other neighbouring areas may be brought within its scope if this should seem desirable as the inquiry develops.

EMPLOYMENT FOR TUBERCULOUS PATIENTS

The Tuberculosis Association recently appointed a committee to study the problem of the immediate provision of work for tuberculous patients, who, after sanatorium treatment, the disease being quiescent, can do a certain amount, although full resumption of work would be impossible or inadvisable. The committee has issued a memorandum suggesting that discharged sanatorium patients who have a negative sputum should be employed half-time in ordinary factory shops. There appears to be no great difficulty at present in providing half-time work if the numbers attending are divided equally between the morning and afternoon shifts. An alternative proposal is to have part-time work in groups in special sections of factories. This is a more elastic arrangement whereby the patients would work a variable number of hours under favourable conditions, the number of hours to be determined by the tuberculosis officer in consultation with the employer. Either arrangement would ensure a probationary period of sheltered employment before a return to full work. Payment on a time basis would probably be insufficient to maintain a healthy standard of living, and therefore the wages would have to be subsidized through some agency. The local authorities through public assistance committees have certain powers in this direction, and they can and do subsidize the wages of their patients who are already working in village settlements, so that there is good precedent for a subsidized wage. With regard to patients with a positive sputum who can nevertheless do a certain amount of work, the committee thinks that simple light industries not requiring complicated machinery or power might be provided at the larger sanatoria. The extent of the problem must be largely guesswork. In 1937 there were 122,135 adult patients with tuberculosis of the lungs on the dispensary register of England and Wales; there are probably rather more now.

Reports of Societies

WARTIME DIETARY: MINERAL AND VITAMIN REQUIREMENTS

A meeting of the Section of Medicine of the Royal Society of Medicine was held on May 26, under the presidency of Dr. GEOFFREY MARSHALL, to discuss mineral and vitamin requirements in relation to wartime dietary.

Calcium, Iron, and Phytic Acid

Dr. R. A. MCCANCE opened by asking whether calcium and iron in the wartime dietary were different in amount from the proportions which obtained before the war. It had been rather fashionable to represent the people of this country in peacetime as living on the borderline of calcium starvation. He never subscribed to that view in its entirety, believing that its substratum of truth had a good deal of political overlay. But no one ever suggested that the people of this country were getting too much calcium or iron, and it was quite certain that a good many children and pregnant and lactating women were not in pre-war days getting as much as they ought to have had.

Diets had been considerably modified by the war. Before the war food was regulated by preference and price, but now the matter had become one of planned food distribution. Milk, for example, had been redistributed so that children got more than before and some adults went short. Certain studies of the calcium intake in representative groups of people, adults and children, showed it to be much about the same as before the war, and the same was true of iron, for although there had been a reduction in the amount of iron obtained from rationed food owing to limited supplies of meat, this was more than made up by the 85% extraction bread, which had twice or nearly three times as much iron in it as the bread which most people ate before the war. This, however, was not the whole story. What had to be determined was whether these minerals were as well absorbed from the wartime diet. Dr. McCance gave an account of experimental investigations in which bread from 92% extraction flour had been used and into which some calcium had been put. The calcium was found to be not as well absorbed from these diets as from the usual pre-war diet. The change from white to brown bread was

accompanied by a much poorer absorption of calcium. The question was considered whether this poor absorption was due to the greater laxative action of brown bread, but this was ruled out, and the cause appeared to be the presence of phytic acid. The same held good for iron. With the change from white bread to brown there was a large increase in the intake of iron, but also a large fall in the absorption, though he added that this work on iron stood in need of repetition and the results were as yet not so well established as in the case of calcium. It was quite easy to show that if calcium carbonate were added to bread the absorption of calcium was put up to the desired level. It was possible, but not easy, to "dephytinize" bread and make it into a palatable product. But on "dephytinizing" brown bread it was not so good from the point of view of calcium absorption as white, because all the phosphates were left in it, and phosphates interfered with the absorption of calcium. These processes of dephytinizing the bread could not be worked on a commercial scale over the whole country, though it would be possible to run them on a smaller scale for the production of patent foods for infants and invalids. Consequently, if the tendency of phytic acid to reduce calcium consumption were to be counteracted, the only way to do it was to add calcium to the bread. It was true that the present 85% loaf had only about half as much phytic acid as the 92% loaf which had figured in the experiments, and what he had said about the interference with calcium absorption needed qualification to that extent. The scientific evidence was very sound in favour of adding calcium to bread, and those who thought that the nation was short of calcium before the war should have the courage of their convictions now and support a scheme for the addition of calcium.

Prof. R. A. PETERS showed four *x*-ray pictures of himself to demonstrate that long-continued consumption of 85% bread with added calcium gave rise to no signs either of calculus or of arteriosclerosis. About 15 months ago, when the 85% extraction loaf was being much discussed, they took to baking the 85% bread at his home, and after that started to add calcium. He thought that probably his was the only family in the country who had lived—four of them—for 13 months on bread "plus chalk," but their health suffered no regression.

Subclinical Deficiencies

Dr. L. J. HARRIS said that his own investigations during the war had been concerned with tests on groups of people to determine their levels of nutrition in certain specific dietary essentials. One method he had used was the saturation test applied to vitamin C. This enabled the degree of deficit to be expressed on a quantitative scale. There were many who said that scurvy was not seen in this country and therefore the people were having enough vitamin C. But that by no means followed. It was now possible to demonstrate partial or subclinical deficiencies. A partial deficiency of B_1, for example, might cause poor growth in children, gastro-intestinal hypotonia, and a latent defect in carbohydrate metabolism. As for vitamin C, he thought that three symptoms of deficiency seen in experimental guinea-pigs might also be seen in human beings—namely, diminished growth rate, failure in the production of new tissues or regeneration in the healing of wounds, and increased liability to infection. From the German official records last year it appeared that 1½ million children, although showing no signs of scurvy, were given extra ascorbic acid daily, and the results were diminished incidence of infection and improved physique. He also cited work in this country by Glazebrook and by Campbell and Cook, and in America by Lund and Crandon, to the same effect. It was fair to conclude that the idea that vitamins were only qualitative factors had gone by the board, and that a definite quantity of each vitamin was needed to prevent deficiency diseases and a larger quantity to present subclinical deficiencies.

Dr. H. M. SINCLAIR asked whether in Dr. McCance's view the 85% loaf was giving the iron required. If not, he suggested certain means of supplementing iron in the national dietary. Dr. A. P. MEIKLEJOHN also asked whether the addition of iron to bread was justified on the evidence so far presented. He thought it was a common experience that haemoglobin levels were rather low. In a recent survey in Lancashire a random sample of young married women had haemoglobin levels of about 75% on the Haldane scale.

Dr. R. A. MURRAY SCOTT, speaking as a general practitioner, said that he had been endeavouring to find clinical evidence for deficiencies which could be attributed to faulty diet. The prevalence of anaemia appeared to be the only measure. Medical and obstetrical opinion in his part of the country was quite definite that there was an increase of anaemia. There had been a survey of miners in Yorkshire, and, while no anaemia was found among them, there was a reduction of haemoglobin among miners' wives, and it was a very general habit in miners' families for the meat and cheese to be eaten by the men, while the women went without. Second-year medical students at Leeds had estimated their own haemoglobins. For the six years before the war the numerically largest group had always been those with haemoglobin percentages of between 100 and 105, but last year the largest group was those with percentages between 90 and 95. In August, 1941, he made a careful survey of prices, and showed that for an active man a complete optimum diet of reasonable variety could not be purchased for less than 14s., and a similar diet for sedentary workers cost 11s. per week. The rationing of meat, cheese, and eggs reduced the intake of iron from 3 to 1 mg. of available iron per day, so that there was a theoretical expectation of increasing anaemia among the poorer population. The innovation of the 85% loaf, on the other hand, increased the iron of the average diet by about 2.5 mg. a day, without disturbing the supply of calcium and phosphorus which came from milk. Superficially, from this standpoint the change in bread was entire gain. Two adults in his own household had for many months past eaten bread which was almost entirely wholemeal; both were very active and healthy, with haemoglobin of over 100%. How did the iron in their case escape the clutches of the phytic acid, as it evidently did? Did phytic acid always steal minerals from the diet?

Dr. GEOFFREY EVANS said that from his own experience there was some mineral and vitamin deficiency to-day. He had met with cases of acne rosacea with conjunctivitis and minor degrees of keratitis which could be greatly improved by giving riboflavin in a dose of 3 to 6 mg. daily. There were people who suffered from fatigue and depression, and the addition of vitamin B_1 had helped them. He was impressed by the number of persons with haemoglobin values below 85% and the obvious improvement gained by means taken to bring it up to a more normal level.

Prof. J. R. MARRACK gave estimates of the amount of vitamin C in meals taken in British Restaurants and school canteens. The results appeared to vary within wide limits. On the subject of raw vegetables, on which so much had been said, Prof. Marrack pointed out that a great amount of such vegetables had to be eaten to give a reasonable amount of ascorbic acid. A moderate-sized lettuce would give 5 mg. of ascorbic acid, but three times as much was obtainable in a good helping of cooked potatoes. As for the possible demineralization of brown bread, he had for thirty years eaten brown bread, and he had played rugger until he was 44. He thought that if he had been "demineralized" by brown bread it would have shown itself before the end of his last season.

Dr. H. E. MAGEE drew a distinction between the methods used for setting up standards for proteins and minerals and for vitamins. In the case of proteins and minerals the standards had been arrived at as the result of clear-cut balance experiments, in which intake and output were determined, but in the case of vitamins it was not a question of balance but of determining the existence of disease or not, and the difficulty was in discovering any subclinical state. Therefore the so-called standards of vitamins recommended seemed to him more or less speculation. Mr. A. L. BACHARACH said that in order to increase the general intake of iron the amount of 5 mg. a day per person in this country would only entail an annual output of 80 tons. The incorporation of 5 mg. of iron in the daily ration of bread, which was legal in the United States though not compulsory, would be a simple thing to carry out, with no technical difficulties.

Dr. MCCANCE, in reply, pointed out that it was quite easy to discover an individual's calcium requirement, but a very difficult matter to assess the calcium requirements of the population. Evidence taken from individuals was exceedingly risky if applied generally to the whole country.

ADRENOGENITAL SYNDROME

At a meeting of the Section of Anatomy and Physiology of the Royal Academy of Medicine in Ireland on March 14, with Prof. J. F. DONEGAN in the chair, Dr. T. E. BRADSHAW and Prof. W. J. JESSOP read papers on the biochemical findings in the case of adrenogenital syndrome previously shown at the Academy by Dr. L. K. Malley. The patient, a girl of 13, showed the typical clinical features of the condition, and laparotomy had revealed bilateral enlargement of the adrenals. The ovaries were normal, and, although there was some evidence of previous ovulation, there were no corpora lutea. Subsequently one considerably enlarged adrenal had been removed. The biochemical investigations comprised estimations, before and after adrenalectomy, of (*a*) the urinary excretion of 17-ketosteroids, oestrogens, and sodium pregnandiol glycuronidate, and (*b*) the plasma electrolytes. The values of 17-ketosteroids, which had been taken as approximately proportional to androgen excretion, were all very high, as were those for sodium pregnandiol glycuronidate. The value for oestrogen excretion was also considered high for a girl of that age who had never menstruated. Operation produced little, if any, change in the excretion of these substances. The authors concluded (1) that the adrenal gland is a source of both androgenic and oestrogenic substances, and (2) that it might be a source of pregnandiol or of some precursor substance. The investigation of plasma electrolytes had indicated that, associated with the evidence of hyperfunction outlined above, there was a deficiency of salt-regulating hormone.

Musculature of Renal Calices

Mr. C. J. A. WOODSIDE, in a paper on the musculature of the calices of the kidney, said that it was a familiar observation that any obstruction in the ureteral tract caused dilatation of the proximal portion. It had also been recognized for some time that the pelvi-ureteral junction was one of the commonest sites of such obstruction, and that in such cases this region behaved as if achalasia of a sphincter mechanism were present. Although some observers had failed to see evidence of a sphincter muscle in histological sections of this region, he thought that the slides prepared by Prof. Walmsley left little doubt of its existence. Apart from this, not much attention had been paid to the way in which the dilatation progressed upwards. For a long time he had been impressed by the fact that pyelograms of cases of hydronephrosis showed that the dilatation proceeded by regular stages. When the lower ureter was the obstructed area the distension proximal to this point was arrested at the pelvi-ureteral junction for some time before it extended to the pelvis. When this junction itself was the origin of obstruction the pelvic dilatation which followed did not spread immediately to the calices, but for a time was barricaded—first, where the major calices sprung from the pelvis; secondly, when this barricade fell, where the minor calices sprouted from the major; and, lastly, where the infundibula budded from their stems. In support of this view one found cases in which obstruction appeared to affect either the major calices alone or even the minor calices or their infundibula. It would thus appear that the sphincter mechanisms were sometimes affected in groups. The deduction to be drawn was that the pelvis was really a group of chambers contracting in regular sequence from the first series—i.e., the infundibula and minor calices, then the major calices, and then the pelvis proper. This view was not a new one, but it had been difficult to find any reference to conclusive histological evidence that sphincters existed at these points. Von Mollendorf and many others were not able to satisfy themselves that there was a clear differentiation of the musculature of the parts of the pelvis into layers, but recognized that circular muscle bundles were more dense and constant in the calices than elsewhere. Prof. Walmsley and he (Mr. Woodside) believe that at the junction of the major calices and pelvis, at least, there was a demonstrable muscle bundle of sphincter type, and also a vascular arrangement such as was generally present in sphincter regions. His final conclusion was that under physiological conditions the expansions of the pelvis and its appendages acted by the serial filling and emptying in succession from the cephalic end.

PREPARATION OF DIPHTHERITIC SERUM

At a meeting of the Fever Hospital Medical Service Group of the Society of Medical Officers of Health on May 8, with Dr. E. H. R. HARRIES in the chair, Dr. L. F. HEWITT (Belmont Laboratories) opened a discussion on recent improvements in the preparation of antitoxins. The use of unprocessed antitoxic serum, with its low potency and its tendency to cause severe serum reactions, was, he said, first superseded by the use of antitoxic globulins after removal of much of the inert protein fractions. With this material, and the improvements introduced from time to time, more potent antitoxins became available, and severe serum reactions were much fewer. More recently, enzyme-treated antitoxins had been developed, in which not only had inert proteins been removed but the antitoxic proteins themselves had been split into active and inert fractions. This was brought about by proteolytic enzymes, such as pepsin, acting under conditions in which the proteins were disaggregated into smaller molecules without allowing the occurrence of true digestion into peptones and amino-acids. Not only was the antitoxin thus produced of high potency, but it had other advantages, including rapidity of absorption, slow disappearance from the body, and a smaller tendency to cause serum reactions or sensitization, even when given in massive doses. There was no evidence of the absence of any essential factor from this enzyme-treated material. Recent laboratory work on diphtheria had failed to reveal any other antibody necessary for treatment; for example, late diphtheritic paralysis in animals had been shown to be due to ordinary diphtheritic toxin and to be prevented by early administration of antitoxin. Factors had recently come to light explaining the high toxigenicity of *gravis* strains of *C. diphtheriae* in patients and their comparatively low toxigenicity in the usual artificial culture media. The culture media usually employed were deficient in iron, and strains other than *gravis* produced potent toxins, but when the iron content of the medium was increased to a level comparable to that in the throat the toxigenicity of *gravis* was still considerable, while that of other strains was greatly reduced, thus providing an explanation of the clinical results.

In conclusion Dr. Hewitt stressed the importance of obtaining clinical reports on the new antitoxin preparations.

Refined Serum by the Intravenous Route

Dr. E. H. R. HARRIES said that reactions so rarely followed the injection of these refined products that it was difficult to find serum rashes to demonstrate to students. He was coming to the conclusion that, provided all or part was injected intravenously, doses in excess of 50.000 units were seldom indicated.

Dr. H. J. PARISH said that experiments in the laboratory had shown that there were wide differences between strains of *C. diphtheriae* in respect of toxigenicity and virulence. These variations might explain why antitoxin was more effective in some cases than in others. Many valuable hours could be gained and expense saved by giving antitoxin intravenously. A relatively small dose intravenously was more useful than many times the unitage given intramuscularly. Antitoxin neutralized toxin in the circulation but could not deal with toxin already fixed to the cells of the body. Was antitoxin less effective unit for unit to-day than before the introduction of refined serum, and had it become qualitatively different since the early days of serum therapy? Some years ago the tendency had been to give a very high therapeutic dosage—e.g., 300,000 units intravenously—but he had been told in one hospital of equally good results obtained with 50,000 units or less. This did not suggest that antitoxin had become "weaker," but was it general experience?

Dr. L. J. M. LAURENT said that with modern concentrated antitoxin there were still two problems requiring solution: (1) The rigors after intravenous injections, which were not due to serum hypersensitiveness and which seemed associated with certain batches of antitoxin. (2) The delayed response of some severe cases of diphtheria to antitoxin, even when the cases were early and given adequate doses intravenously. Variations in the infecting strain, in the patient's susceptibility, and in some hypothetical "avidity" factor in antitoxin had been put forward, but no explanation accounted for all the facts. This occasional delayed response to antitoxin was well known 20

years ago, when only natural serum was used. His experience of those days did not bear out the view that improvement was then more rapid than now.

Thermal and Other Reactions

Dr. H. S. BANKS said that serum sickness as well as the anaphylactoid reaction following intravenous injection were practically abolished by the use of "digest" concentrated antitoxin. The thermal reaction, arising about half an hour after intravenous injection, was given by earlier batches but not by those now in use. Some recent cases of apparently simple tonsillar diphtheria treated with as much as 40,000 units intravenously on admission had progressed to the "bull-neck" stage with extensive palatal membrane and oedema within 12 to 24 hours. Such cases were, however, rapidly controlled by a further intravenous injection of 100,000 to 150,000 units. Although there was sometimes a time-lag in its action, large intravenous doses of the new antitoxin, repeated if necessary, could be relied upon to effect a rapid cure of the early hypertoxic case of diphtheria, and often did so without paresis or other complications.

Dr. M. MITMAN said that for some years he had regarded thermal reactions—rigor and collapse—as fundamentally different from the antigen-antibody reaction responsible for serum disease, chiefly because a serum rash might occur 7 to 10 days after giving serum to a patient who had had a rigor 20 minutes after the injection. If thermal reactions had materially diminished in frequency with protein-disaggregated serum some light might be thrown on their aetiology. In diphtheria he did not regard the extension of local manifestations within 24 hours of giving serum as proof of the failure of serum. The appearance of membrane was an end-result of a biological process which might have begun before the serum was given; at the time of administration there might be little or no clinical evidence that the mucosa was affected.

Dr. C. G. POPE drew attention to some technical difficulties in the purification and concentration of antitoxic sera.

Dr. R. CRUICKSHANK supported the evidence that in cases of toxic diphtheria a local worsening of the infection might occur during the 24 hours after an apparently adequate dose of refined antitoxin had been given intravenously. The swelling of the neck glands and tissues was probably associated with an invasive property in the *gravis* and *intermedius* strains responsible for severe infections. In fatal cases these types of the diphtheria bacillus could be isolated from both cervical and mesenteric glands which showed inflammatory and necrotic changes, and antitoxin was apparently unable to counteract this invasive factor in the bacillus. He wondered, too, if over-refinement might not reduce "avidity," though little seemed to be known about this property in antitoxin. In prophylaxis more rapid absorption would necessitate a longer interval between the Schick test and the prophylactic dose if a reliable reading was to be obtained. Might the very small volume of the prophylactic dose lead to more rapid elimination and hence a shorter period of protection?

In reply, Dr. HEWITT said that it seemed apparent from the clinical results described that enzyme-treated antitoxins met with the general approval of clinicians. These newer preparations were evidently a marked improvement on previous antitoxins. By close co-operation between clinicians and serum laboratories continued improvement might be anticipated.

The report of the Director of Medical and Sanitary Services, Ceylon, for 1940 states that malaria, as in previous years, was the most prevalent disease, some 97,000 cases being treated in hospitals and some 2,994,000 at the outdoor dispensaries. The chief outbreak occurred in the south-western part of the island early in May, continuing until the middle of July. In the North-Western Province an epidemic of dysentery, due to the Shiga bacillus, also started in May. The rapidity of the spread of infection was aggravated by the breeding of hosts of flies at Kongoda Estate, a result of some unsatisfactory manuring. During the year the Leprosy Survey of the island, begun in 1933, was completed. The total number of patients was 2,771—2,032 males and 739 females—of whom over 1,000 were segregated in two leper asylums. The whole population of Ceylon is estimated at 5,951,000. Total births in the year under review numbered 212,982, a rate of 35.8 per 1,000; deaths numbered 122,738, a rate of 20.6. The infant mortality rate was 149 per 1,000, the maternal 16.1.

Correspondence

Diphtheria Prophylaxis

SIR,—Your leading article of May 2 asking the G.P. to lend all his weight to an all-out effort to immunize every British child before the next winter follows the publication of one of the most important and practical contributions ever made to the literature of diphtheria prophylaxis—namely, Drs. F. Fulton, B. Moore, Joan Taylor, and A. Q. Wells, and Prof G. S. Wilson's article (March 7 and 14). The article, we hope, was widely read by all practitioners who are called on to perform an immunization, and being based on such large numbers of children it provides an authoritative guide to material, dosage, and results.

To my mind, in view of the impending immunization drive, one of the most important facts coming to light from it is the rather glossed-over statement that certain brands of A.P.T. used in whatever dosage gave a Schick-conversion rate of 68.2% to 74%. Most unfortunately no further reference is made to these particular brands either in the original paper or the *Journal* leading article, and the reader is left with an alarming uncertainty in his mind as to whether he has used the good or the bad brands in his recent immunizations. There have been times since the war started when the supplies of the recognized leading manufacturers of A.P.T. ran short (for the G.P.) and use had to be made of whatever could be obtained from the lesser-known manufacturers. Were these the firms responsible for the bad brands? Are there still on the market brands of A.P.T. which are relatively inert? Nothing could be more weakening to an attempted all-out drive to immunize children than the knowledge that there exist on the market brands of A.P.T. of proven uselessness available to the G.P., who has no means of knowing what a dangerous commodity he is handling. If this knowledge becomes public great harm will result and valuable propaganda be put in the hands of anti-injectionists, who are inclined to go on using their data long after the matter has been remedied.

If the B.M.A. is going to sponsor this all-out drive will it not either publicly announce the safe brands of A.P.T. or circulate a letter to every practitioner privately informing him of the safe brands? Unless this is done the public's faith will be shaken in immunization by disasters which must inevitably occur in the mis-immunized children.

Since the publication of the work of Fulton and his co-workers I have Schicked about 100 of my patients; 65 of whom are girls at a high-class boarding-school, all of whom had been immunized more than 4 months previously by their own doctors in all parts of England or by myself. There were 7 positives. It is significant to note that none of the 65 had been Schick-tested after their immunizing injections, although I had begun to Schick-test some of the ones I had injected just before the publication of the article. If reliable brands are made known now the omission of posterior Schick-testing so often due to the apathy of the parents, or rather their faith in injections, will not be so serious a matter. If we wait until legislation has been introduced to keep the bad brands off the market a lot of valuable time will have been lost and the seeds of doubt in the efficacy of immunization well and truly planted. This, coming at a time when nearly 100% successful results are within the reach of all G.P.s, would be a tragedy.—I am, etc.,

St. Ives, Cornwall. E. C. ATKINSON, M.B., B.S.

*** With reference to the questions raised by Dr. Atkinson we are authorized by the Ministry of Health, as licensing authority under the Therapeutic Substances Act, 1925, to make the following statement:

In March, 1941, when it became known that batches of a certain brand of diphtheria prophylactic—A.P.T.—which had been issued by the Ministry of Health to local authorities for free distribution were defective, the following action was taken immediately by, or on behalf of, the Ministry. (*a*) The further issue by the Ministry of batches of this brand of A.P.T. to local authorities was discontinued. (*b*) So far as this could be effected the stocks of this brand which had been issued prior to March, 1941, were recalled and replaced by different brands, which

have proved, in field trials, to give consistently satisfactory Schick conversion rates. (*c*) The administration of a dose of 0.3 c.cm. of the high-quality A.P.T. supplied to local authorities was recommended in the case of children to whom the defective brand in question had been previously given. (*d*) A comprehensive laboratory investigation was instituted with the object of examining as many batches as possible of A.P.T., both defective and effective, which had been used in field trials, of comparing their performance in laboratory animals with that obtained in the field, and, on the basis of the results so obtained, of establishing the laboratory testing and administrative control of A.P.T. on a sounder and more scientific basis than had hitherto been possible.

To facilitate these investigations a new Schedule of the Therapeutic Substances Regulations for A.P.T. was prepared in draft form. This was designed so as to remedy certain defects which had been revealed in the present schedule, and such information as was then available to the authority was used as a basis for devising tests to ensure the more effective control of diphtheria prophylactics, and especially of A.P.T. The licensed manufacturers and their technical advisers were invited to meet the licensing authority, and the laboratory and administrative problems involved were considered. The draft schedule was presented for criticism and discussion, its purpose outlined, and the help and co-operation of the manufacturers and their advisers were solicited. Field and laboratory tests of samples of A.P.T., designed to test the practicability and effectiveness of the provisions of the new draft schedule, were instituted, and when these had been completed a further meeting between the licensing authority and manufacturers was held, when the results were presented and the whole situation was again reviewed. At this second meeting a very important step was taken. On their own initiative the manufacturers proposed, and entered into a voluntary agreement to implement their proposals, that pending the completion of the authority's field and laboratory investigations, and the promulgation of the new schedule in its final form, no batch of A.P.T. would be prepared and issued by them unless it contained not less than 50 flocculation equivalents per c.cm., and unless the sample, when submitted to a series of agreed laboratory tests in animals, reached a certain minimum level of performance. They further agreed to carry out the proposed tests in their own laboratories, to submit samples of the same material for similar tests by an independent laboratory on behalf of the licensing authority, and also for clinical trial. These conditions were proposed, accepted, and agreed to, because the evidence then available from the field and the laboratory indicated that preparations of this composition, and capable of this performance in laboratory animals, should prove to be highly effective and reliable antigens in man. Following this second meeting, three manufacturers intimated that they were, at the time, unable to prepare batches of A.P.T. conforming to the high standards accepted in the voluntary agreement, and, pending research into their methods of production, and until such time as they were able to produce the high-quality antigens which they recognized to be essential, they had ceased the production of A.P.T. intended for distribution and sale. A fourth manufacturer subsequently informed the authority that his product would not be marketed.

With regard to the brands of A.P.T. available, local authorities are empowered (under Section 177 of the Public Health Act, 1936) to provide this material free of charge to medical practitioners. Since the recall of the defective batches of A.P.T. the Ministry has taken all practicable steps to ensure that the material issued to local authorities is of high antigenic potency, and in case of doubt or difficulty general practitioners can obtain supplies of reliable A.P.T. by application to their local authorities; but as only 5-c.cm. containers of A.P.T. are available practitioners are asked not to apply for any until they have at least eight children awaiting immunization.

A.P.T. can, of course, be manufactured in this country for sale or imported from abroad only by those holding licences from the Ministry under the Therapeutic Substances Act, 1925. In normal times all therapeutic substances controlled under the Act, whether of home or of foreign manufacture, must conform to the same statutory requirements. On account of war conditions the importation of A.P.T. prepared in other countries has ceased; by the time normal trading conditions are restored the revised schedule for the control of A.P.T. in this country will have been promulgated, and A.P.T. prepared in foreign countries and distributed through import licensees will be required to conform to the requirements of the new schedule. The latter, when finally completed, will be forwarded, through their respective import licensees, to those laboratories in foreign countries which can be reached under present conditions, in order that such adjustments in regard to the quality, composition, and properties of A.P.T. as are necessary may be made.

The defects in the present schedule are due, in the main, to the fact that neither stable standards of reference nor practicable methods for the quantitative assay of the potency of A.P.T. are available. Research in this field had not yet advanced so far as to provide these essential requisites for the institution of the kind of testing and control which is, happily, available for such substances as insulin, pituitary (posterior lobe) extract, the arsphenamines, and the antitoxins. The present schedule, which appears to have been effective for the control of other forms of diphtheria prophylactic, was, however, unsuited for the control of the much more antigenically active A.P.T. Administrative action can seldom keep pace with new advances in knowledge—which are often in advance of published work—since such action can only be based on information which is freely available to all; and it was not until March 14, 1942, that all the information upon which the authority could base its revised schedule had been published.

The licensing authority welcomes this opportunity of recording its high appreciation of the help and co-operation it has received from manufacturers in circumstances which, for them and the administration alike, have been of exceptional difficulty. In particular, the authority desires to extend a special acknowledgment of its indebtedness to those laboratory and field investigators who placed at its disposal the results of their researches in advance of their publication (in September, 1941, and March, 1942, respectively). This generous help enabled the authority to take the action indicated above without delay.

Child Health

SIR,—My paper on this subject (April 4, p. 429) has produced some interesting correspondence, and I would offer some comments.

Prof. James Young (April 18, p. 504) has properly emphasized the importance of maternal health in pregnancy, and has shown that in dealing with child health the maternal problem must be taken up with it. The mother's health during pregnancy and her health, knowledge, and conscience after birth are all bound up with the health of the infant and child.

Dr. John Thwaites's letter (May 9, p. 595) on the work of Truby King pays a well-deserved tribute to that great pioneer, and shows how little Truby King's work has been understood and applied in our own country. Everyone pays lip service to breast-feeding as the ideal nutrition for the baby, but on the whole our management of breast-feeding by both nurses and doctors is a sorry failure. In one week recently I showed my students two cases where unnecessary weaning was carried out: in the first weaning was advised by a district nurse on the second day after birth "because there was no milk"; in the other the doctor in a small maternity hospital weaned the baby on the third day after birth because "there was not enough milk and it was poisoning the baby." These instances could be multiplied, and indicate a mismanagement of breast-feeding which is deplorable and widespread.

The letter of Dr. D. G. Leys (April 18, p. 505) is a severe indictment of the poor teaching of infant feeding with cow's milk, and of its consequent mismanagement by the family doctor in his practice. Hospital paediatricians see only the failure in infant dietetics; but these failures in both breast- and bottle-feeding are so numerous and so costly in infant lives as to show the existence of nursing and medical malpraxis on a wide scale.

Miss E. M. Pye (May 9, p. 596) points out the great contribution of good midwifery and the well-trained midwife to the low infant death rate in Holland. This was not brought out in my paper, but was emphasized in a previous publication (*Lancet*, May 18, 1940). Her suggestion of keeping the midwife in charge of the newborn baby for a month deserves careful attention. This question is also dealt with by Dr. Violet Russell (May 23, p. 651), who urges collaboration and consultation between the midwife and the health visitor. The

first month is of great importance; its high mortality demands constant skilled medical and nursing care. There should be continuous skilled medical and nursing supervision of the baby from birth. The application of the principle as regards nursing is a matter of administration.

Dr. Hilda F. Menzies's letter (May 23, p. 650) is severely critical of my whole paper, both of the explanations of the fall in infant death rates and of my proposals for reform. An adequate reply to her thoughtful criticisms would require another article; meantime we must agree to differ.

In my paper I pointed out defects in our control and indicated remedies; in particular, I advised the setting up of training schools in infant and child health. In Edinburgh the foundations of such a training school have been laid, and, with the essential co-operation of the child welfare and school medical services, it is hoped to offer a working model of an institution where study, teaching, and practice in child health are combined. But when we look at what has been achieved by the training schools of Truby King in New Zealand and Australia, and by the principal cities in Holland, Sweden, Norway, and the U.S.A., our efforts at control of infant mortality in this country can only be described as tinkering and patching.—I am, etc.,

Edinburgh. CHARLES MCNEIL.

Dry Pleurisy and Epidemic Myalgia

SIR,—Dr. J. Smart (May 16, p. 604) properly calls attention to bronchiectasis as a cause of attacks of acute dry pleurisy. In 24 patients on whom lipiodol investigations were carried out, evidence of bronchiectasis was found in 5. What of the remaining 80%? Dr. Smart suggests that they should be treated as tuberculous in origin. This overlooks that Bornholm disease may produce a similar symptomatology to that described—namely, young adults with pain on breathing or coughing and no abnormal physical signs in the chest except a pleural rub.

During the past few months I have seen a considerable number of cases of Bornholm disease in the Army. The diagnosis has usually not been made, as knowledge of this disease is still not sufficiently widespread, but fortunately the diagnosis of tuberculosis has not been common. In Bornholm disease the onset of pain is usually sudden and may be very severe, but with milder grades and in the absence of malaise the subject may carry on for several days or a week or two before reporting sick, or even throughout the attack. The rub is very variable in character, in some cases being loud and curiously harsh and in others faint, or it may be absent, even with severe pain. It is not certain that either the rub or the pain is always pleural in origin. Cough may be completely absent. Bornholm disease is a transient infection usually with little or no resulting debility or complications, and it would be a tragedy if subjects were treated as tuberculous.—I am, etc.,

London, W.1. H. LETHEBY TIDY, Major-General.

Treatment of Depression

SIR,—We were glad to learn that both Dr. F. T. Thorpe and Dr. E. Cunningham Dax had also obtained satisfactory results in the treatment of depression of later life by convulsion therapy. We can assure Dr. Dax that by the phrase "clinicians being allowed greater latitude in mental hospitals" we did not envisage outside specialists being introduced to do such treatments. We are much too firmly of the opinion that each hospital has to train and encourage its own clinicians, freed so far as possible from administrative ties and encouraged to use their own judgment as to the risks that should be taken to get a patient well by active treatment.

We know how great are the difficulties at the present time for everyone concerned with the treatment of acute recoverable psychoses. Mental hospital staffs have had to be cut down to a bare maintenance level. It is now becoming increasingly difficult to get even acute schizophrenic patients treated with insulin coma, despite the known advantages, in most instances, of this method over convulsion therapy. As a temporary wartime expedient, we believe the remedy may lie in the formation of acute treatment units in certain mental hospitals on a regional basis throughout the country, as with the neurosis centres. It is obvious that fewer cases can be treated effectively when they are scattered, as at present, to a larger number of already overcrowded and understaffed mental hospitals, where they run the risk of being lost among the more chronic material.

However much treatment facilities for recoverable patients are improved in mental hospitals, there will remain numbers of early cases who refuse to go to mental hospitals as voluntary patients early in their illness. Whatever Dr. Dax feels in principle about the question of treating these patients separately from those in mental hospitals, unless in actual fact they are treated outside mental hospitals they will remain incapable of work. Our 32 cases, which greatly improved with active treatment and had been ill 500 months before this treatment was given, are a grim reminder of the present state of affairs. It will need the concentrated efforts of those working outside and inside mental hospitals to remedy the present position.—We are, etc.,

D. E. SANDS.
Sutton, Surrey. WILLIAM SARGANT.

SIR,—We consider that the article by Drs. Dalton E. Sands and William Sargant (April 25, p. 520) will be of great value in drawing attention to the beneficial effect of electric convulsion therapy for involutional melancholia and other depressive states. In the present state of knowledge this form of treatment should in our opinion be always given a trial in preference to the more drastic procedure of frontal leucotomy, the published results of which hitherto have not been particularly impressive.

We have used this treatment for 88 cases of involutional melancholia, but since we only introduced the treatment to Shenley Hospital in Nov., 1940, enough time has not yet elapsed to enable us to make a follow-up study of a sufficiently large number of those cases which, at the time of leaving hospital, appeared to have made complete recovery. We know of several psychiatrists in this country who have been using this treatment for over 2 years and who must individually have treated some hundreds of cases; thus Drs. Sands and Sargant may well have cause to comment on the paucity of literature. We can, however, appreciate the general reluctance of psychiatrists to publish their results. We were quite enthusiastic at one time over the insulin coma treatment of schizophrenia; so many, however, of our former "recoveries" have now returned to hospital that, although not wishing to detract from the value of the insulin treatment, we have greatly modified our views on it.

With electric convulsive therapy the immediate beneficial results are dramatic, but we at Shenley Hospital are greatly encouraged by the fact that of 20 cases discharged from hospital over a year ago only one has since relapsed. We think, moreover, that at this stage much useful information could be published as to the selection of suitable cases, the factors which should be regarded as contraindications to treatment, and the avoidance of risks and complications. Our experiences at Shenley Hospital have taught us the importance of psychotherapy as an essential part of, and not merely a contribution towards, the treatment.

The suggestion of Drs. Sands and Sargant that the E.M.S. neurological unit provides the ideal surroundings for treatment thus fills us with foreboding, because owing to the simplicities of the technical side of the treatment and the dramatic immediate improvement which is obtained in most depressive states, we visualize a day when it may be left to the house-surgeon to "press the button."

We quite agree with Dr. E. Cunningham Dax (May 9, p. 593) that in a modern mental hospital little difficulty is experienced in segregating voluntary from certified patients, and that in practice patients rarely offer opposition to entering a mental hospital. We do not consider it desirable in general to treat new cases as out-patients, because, apart from other difficulties and risks, this approach hinders one from using effective psychotherapy. In the psychiatric clinics attached to Shenley Hospital we have hitherto found no patient expressing a desire to receive the treatment at a general hospital in preference to entering a mental hospital.

Finally, it may be deduced from the foregoing remarks how strongly we disagree with the statement by Drs. Sands and Sargant that ". . . since a physician using electrical methods and working only two hours a day can treat over 50 uncomplicated cases in a week."—We are, etc.,

OTHO W. S. FITZGERALD.
Shenley, Herts. MARGARET V. SAUL.

Brain Damage in Shock Treatment

SIR,—With reference to your annotation on brain damage in shock treatment (May 30, p. 674), while everyone who is dealing with this type of patient must be alive to the possibility suggested in your article, it is perhaps not quite fair to suggest that the result of experimental damage on the brains of monkeys may be taken and compared directly with the clinical use of shock treatment. Should, however, prolonged observation confirm the fact of damage to neurons, it is perhaps a little out of proportion to veto this line of treatment, which, as you yourself suggest, is "a striking advance," since the progress of the illnesses for which it is prescribed is only too often, in its absence, a steady mental deterioration.

I feel sure that medical men who have had experience of this form of therapy, while not subscribing to some of the more extravagant claims and the application of it to every type of case, can point to very definite and real advantages in dealing with certain types of schizophrenia, and more particularly in the elder depressives.

I might add that with adequate safeguards I consider the use of convulsion therapy justifiable in an out-patient department of a general hospital. It is in the early cases, perhaps, that treatment of this type may be expected to have its most beneficial result. But it is too early yet to make any definite pronouncement about the continuance of the relief obtained by these measures. I myself have now treated as out-patients over 100 cases in my department of a general hospital, and I hope shortly to publish a short statement of the analysis of these.—I am, etc.,

Sheffield. E. FRETSON SKINNER.

Urea and its Effect on Tubercle Bacilli

SIR,—With reference to my short paper on urea and its effect on tubercle bacilli (May 16, p. 609) I find that I omitted an important reference which, had I known of its existence, would certainly have demanded to be mentioned by me. I now find that Dr. Henry Harper, in the *Lancet* of March 9, 1901 (p. 694), made an observation on lines very similar to mine. He was recommending urea for use in pulmonary tuberculosis to be given in large doses—he gave up to 60 gr. in the day and up to a total of 59 oz. in a course—and ended up his paper with the following words: "In the laboratory I have tried twice to get the tubercle bacillus to grow in freshly prepared meat-broth, adding urea from 1 to 0.001%, at the same time inoculating a tube without urea as a control. In the control tubes bacilli grew all right in the incubator, but those with urea added failed."

This remarkable observation appears to antedate my own experiments by over forty years, and to have been carried out at a time when bacteriology was still handicapped by limited knowledge. Harper maintained his thesis of the beneficial action of urea in phthisis in the *Lancet* of June 15—and of Dec. 7—of the same year. His opinions were, however, controverted by S. Vere Pearson, who published, in the same journal (2, 1384) of 1902 a series of cases in which urea was tried at the Brompton Hospital without any notable effect. It is to my friend Dr. Vere Pearson that I am indebted for a reference which led to my finding the passage above quoted.

I do not pretend to say whether urea given by the mouth in large doses is or is not calculated to arrest or delay the progress of tuberculosis, but I feel that it is right to pay a tribute to one who appears to have demonstrated the power of urea to control the growth of tubercle bacilli in 1901, and whose observations may have been forgotten by many to-day.—I am, etc.,

Cheam. S. LYLE CUMMINS.

Closed Plaster for Burns of Limbs

SIR,—Though the closed-plaster method of wound treatment now meets with almost universal acceptance as an ideal method of treatment of compound fractures and extensive wounds of the soft parts, the advisability of extending its scope to the treatment of both superficial injuries and burns seems questionable. Dr. T. J. Roulston (Nov. 1, 1941, p. 611) claims rapid healing of burn cases treated in this manner, though he admits difficulty in assessing the extent of destruction. Our experience in a general hospital in India, into which we received war casualties, mainly those of a serious or chronic character, has led us to entirely opposite conclusions. We found that burns treated in plaster, at any rate under semi-tropical conditions, had a tendency to heal very slowly and with the production of excess of scar tissue. On the whole, the functional results, especially where joints had been immobilized, were poor. More rapid healing and superior functional results were obtained by antiseptic dressings, not necessarily frequent, combined with early skin grafting. My colleagues and I were strongly of the opinion that the application of plaster to an extensively burned limb in which sepsis was present was the worst possible form of treatment, and justifiable only in exceptional cases, and as a method to be employed where the cases have to be transported.

It is ridiculous to assume that the persistent presence of pus under a plaster is a harmless feature, especially when it can be observed quite often to cause excoriation of healthy skin. It must be regarded as a formidable disadvantage which is outweighed by the other advantages of the method. We have found that, when the healing of a wound under a closed plaster is well advanced, the final stages of wound repair can be appreciably accelerated by removing the plaster and dusting the wound with boric acid or even tannic acid powder, and without dressings, keeping it dry by means of the blast from an electric hair-dryer. In fact this treatment has many features in common with the tan treatment of burns. Conversely, it is sometimes necessary to apply plaster—for example, further to immobilize a fracture—over a recently healed wound, and it is not very uncommon to find these wounds break down and ulcerate, presumably on account of the maceration produced by the presence of the damp plaster and lack of ventilation.—I am, etc.,

FRANKLYN STONHAM,
Quetta. Major, I.M.S.

A Simple Jaw Splint

SIR,—I am sending you the following particulars of my jaw splint in the hope that it may be of service elsewhere than in this country.

I designed this splint while in England in 1939 and submitted it to Mr. Kelsey Fry, the well-known authority on jaw and dental surgery (my former colleague at Sidcup). He pronounced it as likely to be very good and useful where there was an extensive wound of the chin and comminution of the anterior part of the mandible, provided it were well padded, for it would to some extent overcome the inward pressure occasioned by a plain bandage. I then approached a leading instrument maker, who informed me that the Services demanded that all such forms of splints must be of rustless steel. I was quite certain that such a regulation would defeat the principle, which it did. A splint was made, and upon any attempt to mould it into shape it promptly broke.

On March 14, 1941, upon the invitation of the O.C. and officers of a Royal Canadian Hospital, I described my various splints, etc., before lunch. A subsequent afternoon tour of the hospital brought me to the dental department, where I was presented with a copy of my jaw splint for approval. What a lesson in promptitude! Examined, approved, and constructed all in the space of an hour. Our S.A.M.C. Dental Department at these headquarters have been equally prompt to approve and distribute my splint to the front. Here favour is shown to the use of double 1/16-in. galvanized wire, and this when employed later for more permanent work is cased with plaster.

When used at the front in ambulance, or in transport by air or sea, I advise a pad of gamgee tissue and packet of sulphonamide to dust on a wound and the whole enclosed in canvas pockets. Given the idea any mechanic with a pair of pliers can fashion this splint out of a single strand of straightened barbed wire.—I am, etc.,

J. L. AYMARD, Capt., S.A.M.C.,
Pretoria, S.A. Formerly Plastic Surgeon, Sidcup Jaw Hospital.

Delay in the Union of Fractures

SIR,—Prof. T. P. McMurray's suggestion (Jan. 3, p. 8) that too early application of non-padded plaster casts is responsible for an increase in the number of cases of delayed union of fractures of the tibia is interesting. But non-padded casts are used in forearm fractures at just as early a stage, and an increase in the number of slowly uniting fractures of the ulna has not been noticed. Some other method of treatment must be at fault. I suggest the increasingly popular screw-traction frames of Böhler, Mr. Watson-Jones, and others. The use of these frames ensures that good alignment and full length will be obtained, and these so easily that the frames are used in many cases which could be reduced by manual methods. During reduction on screw-traction frames the fracture is first overextended, and wires or pins incorporated in the plaster cast plus absence of muscle spasm maintain the overextension long enough to enable blood to clot firmly between the bone ends. Regenerating bone has, therefore, a small gap to fill, whereas manual reduction, if stable, causes impaction of the fracture.—I am, etc.,

JOHN E. GRAY,
Capt., R.A.M.C.

Stalag IXc, Germany.

Yellow Fever Prophylaxis

SIR,—In your issue of Feb. 21 (p. 270) there appeared a letter on yellow fever prophylaxis by the chief medical officer of British Overseas Airways Corporation. That letter complains of the lack of uniformity in African Dependencies with regard to the number of days which must elapse after inoculation for yellow fever before the person inoculated is regarded as immune. In Col. F. P. Mackie's letter it is stated that in Northern Rhodesia 15 days are required to elapse before the person inoculated is regarded as immune. This is not the case and never has been the case. The number of days required is 14, and there is therefore complete uniformity among the African Dependencies usually referred to as the East African Group.—I am, etc.,

JOHN F. C. HASLAM,
Director of Medical Services.

Lusaka, Northern Rhodesia.

Douching the Eyes in Gas Contamination

SIR,—The personnel of decontamination centres are certain to experience much difficulty in carrying out thorough douching of the eyes when gas contamination has caused even a mild degree of blepharospasm. I have not seen any mention in the official handbooks on the subject of the following simple procedure for keeping the eyes open during douching. Seated on a stool, the patient is instructed to tilt the head back, facing the ceiling, and then look at the tip of his nose. With the thumb and index finger of the left hand the attendant pinches up a fold of the loose skin of the upper eyelid and pulls it steadily upwards towards the eyebrow while washing out the eye with the nozzle of the douche in his right hand. It is impossible for the patient to close the eyelid so held, and the upper fornix is easily reached by the lotion.—I am, etc.,

N. HOWARD MUMMERY,
Factory Medical Officer.

Complacency in Anaesthetics?

SIR,—I was very interested in the letter of Dr. E. C. Atkinson (May 9, p. 595). Anaesthetics have made such progress in the past twenty years that operations are undertaken now which would never have been dreamt of years ago. I would instance such operations as cardio-omentopexy and total gastrectomy. Surely it cannot be denied that the skilled anaesthetist with his complicated machine is essential here. Dr. Atkinson suggests that present progress has made life more comfortable for the anaesthetist. I am not certain of that, but I am certain that it has made life infinitely more comfortable for the patient. The great trouble about all new drugs is that they get taken up by men as unskilled as they are enthusiastic. Modern methods and modern machines in skilled hands give the ideal conditions. Were I the victim, I would far rather have a "rag-and-bottle" anaesthetic given by a skilled man than one from a complicated machine administered by a novice.

To compare a McKesson to a Boyle is rather like comparing a Rolls Royce to an Austin 7. The McKesson is a beautiful and accurate machine, but needs to be carefully looked after. For straight gas-oxygen anaesthesia it is about the only reliable machine. Most Boyle machines are merely a means of giving ether with the help of gas-oxygen.

It is a little unfair to say that labour cases seldom go wrong under the "rag-and-bottle." It is a well-known fact that it is almost impossible to kill the woman in labour. In conclusion, it could hardly be denied that the simpler the anaesthetic and the simpler the mode of giving it, the safer. However, my point is that, were we limited to this simplicity, the surgeon would never have been enabled to advance his art to the high standard he has now attained, and many more lives would be lost by one's inability to help with surgical intervention than are lost by modern methods.—I am, etc.,

H. PARRY-PRICE, Surg. Cmdr., R.N.V.R.,
Senior Anaesthetist, Royal Berks Hospital, Reading.

Treatment of Threadworms

SIR,—May I mention a method of treatment which I have used for some time and which I reported to the British Paediatric Association in 1937. It is the administration of bismuth or barium in quantities similar to that given for an *x*-ray meal or enema. A full treatment is to give a bismuth or barium enema first and to follow it in 2 days' time with a similar meal. The meal is often repeated weekly for 3 to 4 weeks. Most of my later cases have been treated by meals only.

The treatment aims at a mechanical effect, the ideal of which is to fill every saccule and crevice with a medium that should sweep away mucus and ova and worms. This method differs from that of the French writers (*British Medical Journal*, 1929, **2**, 604, and *Progr. méd.*, Paris, 1920, 3 s., **35**, 339), who use bismuth with considerable success for its toxic effect on the worms. Actually, through an excess of caution, a fair number of my cases were given only a 1/2-oz. or, in young children, a 2-drachm meal, and did well on this treatment. This supports the idea that bismuth has a toxic effect on the worms. For this reason it may be better than barium, but it is much more expensive. However, the main idea of my treatment is a mechanical one, and barium has proved quite successful in many cases. The results vary greatly because in the intractable cases threadworms breed high up in the small intestine (duodenal area). Actually there is often a 3-weeks cycle in their appearance. Any course of treatment therefore needs to be repeated after 3 weeks, and perhaps given again several times at this interval. One should not be discouraged by the failure of 1 or 2 treatments.

When phenothiazine was introduced recently I temporarily gave up this mechanical method to try it. I have found it to be successful, and, furthermore, in the small number of cases in which we have had controlling blood counts it did not appear to be toxic. In view of recent developments, however, I regard phenothiazine as too dangerous, and until a less toxic derivative is found I shall revert to the barium or bismuth meal treatment. My usual practice has been to give a meal of 1 or, if necessary, 2 oz. for a child of 5 and a larger one for older children. If the presence of worms round the anus at night indicates an infestation of the large intestine I order the enema first and follow it with the meal in 3 days' time.—I am, etc.,

C. PAGET LAPAGE.

Manchester.

Artificial Sun-baths in Industry

SIR,—The problem of providing artificial sun-baths for factory and other workers is one which for some time has been exercising the minds of those responsible for the health of the workers, and also those whose main concern is production. It is felt that the long hours spent under artificial light and the lack of opportunities for spending the week-ends in the open—at swimming-pools, etc.—result in deprivation of the normal quota of daylight and sunlight, which should be compensated for by artificial means. Other countries—our enemies and our allies—faced the situation before the war. Perhaps the most topical is the splendid installation at the Krupps mines at Essen, built in the early days of the Hitler regime, largely, perhaps, as the result of the lessons learned during the last

war, when numerous "sun hospitals" were established for the treatment of the convalescing wounded. In Russia the value of "sun-baths" in factories was recognized years ago.

In this country the collieries were the pioneers, and the experiment at the Sherwood Colliery is well known. Nothing was attempted on a big scale in pre-war days, but since the war many firms, both large and small, have taken up the matter, and while some of these are excellent, others leave much to be desired.

Recently the Minister of Mines showed his interest by officially opening an installation which I had designed for the Manvers Main Colliery. It is of a revolutionary character and is certainly unique in this country. It is capable of providing sun-baths for 50 workers every 5 minutes, or 750 per hour, day or night. It comprises a corridor along both sides of which the lamps are fitted—five mercury-vapour arcs on each side, interspersed with a similar number of 500-Watt tungsten filament lamps. Running through the centre is a conveyer belt. The miners, after their shower-bath, formerly had to walk to their clean outdoor clothes. Now they pass through a door and step on to the conveyer belt and are carried through the irradiation corridor. At the end they step off and pass through a door which brings them to their clean-clothes lockers. The speed of the belt is so arranged that, knowing the intensity of the radiations and the time taken for one man to travel the length of the corridor at the fixed distance from the lamps, the result will be an exposure which will produce on the average a transient or threshold erythema. This minimal dose, designed as a prophylactic rather than a curative measure, eliminates the possibility of lighting up a latent or aggravating an active tuberculous lung lesion. As it is beyond the control of any individual to vary this, no skilled or unskilled supervision is necessary. The equipment is put into operation by throwing over a single switch. Any defect or breakdown in the mechanism automatically breaks the electrical circuit supplying the apparatus.

It has been in use some time now, and, I believe, provides a solution to the many problems associated with tonic sun-baths in works.—I am, etc.,

London, N.W.1. WILLIAM BEAUMONT.

The Mesentery in Crohn's Disease

SIR,—In the interesting description of two cases of Crohn's disease by F. W. M. Pratt and S. L. Simpson (May 23, p. 634) I see that the desirability of ablation of the diseased mesentery is not emphasized in describing radical treatment of the disease. The importance of this step in avoiding recurrence has been pointed out by Mixter (1939).

The mesenteric changes associated with regional enteritis appear to be constant—briefly, in the earliest stages congestion of the mesentery and enlargement of the lymph glands, progressing in the later stages to great induration and thickening till it becomes almost as thick as the bowel diameter. Microscopically the mesentery may show giant-cell systems, and inflammatory and fibroblastic changes similar to those in the diseased bowel. While we remain in ignorance of the cause of this granuloma, we must not neglect to consider whether the primary lesion may be an obstructive lymphangitis and lymphadenitis in the mesentery, possibly originating in a low-grade infection of the intestinal mucosa, and producing secondary infection and ulceration in the lymphoedematous bowel. Indeed, with this possibility in mind Reichert and Mathes (1936), by experimentally injecting irritating and sclerosing solutions into the mesenteric lymphatics, produced an "elephantiasis" of the bowel resembling the earlier stages of regional enteritis.

It is possible that conservation of a diseased mesentery may be the cause of some of the recurrences after resection. Inadequate removal of intestine is obviously another cause. Such recurrences have been reported before (Jackson, 1937; Crohn, 1939), and a short description of one of mine may be of interest.

This patient, then aged 18½ years, first came under my care in March, 1938, giving a history of abdominal pain for five years and faecal fistulae for two. In May, 1938, I resected 26 inches of ileum, together with the ascending and proximal transverse colon, for regional enteritis affecting the terminal 14 inches of ileum. There was great mesenteric thickening with enlarged lymph glands affecting a similar length, but no more resection of mesentery than was necessary to remove the bowel was made. The disease was associated with infantilism, and was reported on this account (Tanner, 1939). The patient made remarkable progress until December, 1941, when cramping pains reappeared, and a lump was felt to the right of the umbilicus. Laparotomy in March, 1942, disclosed a recurrence of the typical thickening and stenosis at the terminal end of the remaining ileum. The disease was maximal at the site of anastomosis (end-to-side) to the transverse colon, and extended upwards, diminishing in severity for 12 inches. The mesentery was greatly thickened to a like extent, the thickening also continuing along the root of the mesentery for a third of the length of the superior mesenteric vessels. The lymph glands were much enlarged along the whole course of the superior mesenteric vessels. Radical surgery appeared to be out of the question, so a short-circuit to the colon was made 18 inches above the uppermost limit of disease. The patient made a good recovery, but still gets occasional mild "cramps."

In this case it seems that the disease probably spread along the mesentery, as the previous bowel transection was made 12 inches above the highest visibly affected segment. At any rate it appears to be a wise precaution to excise not only a wide margin of healthy bowel but also the thickened mesentery and enlarged lymph nodes when performing radical resections for Crohn's disease.—I am, etc.,

NORMAN C. TANNER.

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Increase in Hypoglycaemia in Diabetics

SIR,—May I inquire if there exists a greater tendency towards hypoglycaemia in diabetics now and whether this is attributed to: (1) the various strengths and types of insulin which create confusion to the new patient; (2) restriction of protein diet due to rationing (this inadequacy despite the supplementary ration); (3) lack of trained personnel at the diabetic clinics due to the war; (4) failure to issue one standard syringe marked in units only.

It would greatly ease the burden of the overworked practitioner if prophylactic measures were taken to decrease this incidence. Most of these attacks occur in the early hours of the morning and necessitate additional work which might have been avoided.—I am, etc.,

London, W.1. E. SUTHERLAND-RAWLINGS.

Macrocytic Anaemia after Gastro-enterostomy

SIR,—On perusing the article by D. S. N. S. Gorden and J. Japa (Nov. 29, 1941, p. 769) I considered a similar case treated by me would be of interest to them.

The following is the case history:

On Jan. 26, 1940, I was consulted by a grazier aged 64. In 1925 he had a gastro-enterostomy performed after the accidental swallowing of spirits of salts. In 1939 he felt his strength departing, and over the following two years became weaker and weaker, with anorexia and extreme heartburn, mental tiredness, and extreme loss of weight, having lost 4 stone during 1939. (At the onset of his illness he weighed 15 stone.) He was unable to work and had to be assisted in walking about. Late in 1939 *x*-ray investigation revealed no evidence of malignancy in his alimentary tract. His medical adviser had noticed his becoming jaundiced at this stage.

On seeing him for the first time in Jan., 1940, I was confronted with a man showing great cachexia, lemon-tinted icterus, and extreme exhaustion. His blood pressure was 118/90. No abnormality detected in thorax or abdomen in the way of abnormal mass or enlarged liver or spleen. The glands in his left axilla and groin were moderately enlarged and of a rubbery consistency. His haemoglobin was 60%. A blood smear was sent to a pathologist, who gave the following report: Film reveals marked anisocytosis, poikilocytosis, and a very large cell type, the average diameter of red cell being 8.5 μ. A differential count showed the following figures: polymorphs 63%, lymphocytes 29%, monocytes 1%, eosinophils 7%. A count of the red cells was not done, nor was a fractional test meal. His weight was 10 stone 10 lb.

Treatment consisted of 2 c.cm. heparol (a local make of liver extract) intramuscularly each day for a week, and then graded until every fortnight for three months. The patient responded quickly to treatment, and in six months had gained 2 stone in weight. He has been maintained at 14 stone 3 lb. for the past twelve months, and he is working from dawn to dusk with all his old vim and energy, and in his own words "feels as fit as when he was twenty years younger."

—I am, etc.,

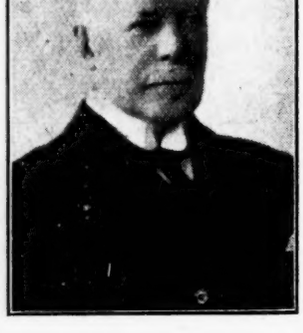
Victoria, Australia. I. CYRIL HARLEM.

Obituary

SIR EDWARD COEY BIGGER, M.D., M.Ch.

We regret to announce the death in Dublin on June 1 of Sir E. Coey Bigger, the distinguished Irish physician who held many important public offices and was Crown Representative for Ireland on the General Medical Council from 1917 to 1927.

He was born in Belfast in 1861, the sixth son of Mr. Joseph Bigger of Ardrie, and was educated in Liverpool, at Queen's College, Belfast, and at the London Hospital. He graduated M.D., M.Ch. of the old Royal University of Ireland in 1883 and some years later took the Diploma in State Medicine of the Irish Royal Colleges. In the early part of his medical career he was visiting physician to the Ulster Hospital for Women and Children and to the Belfast Infectious Diseases Hospital, and superintendent medical officer of health for the Belfast Rural District. He moved to Dublin on his appointment as medical inspector under the Local Government Board for Ireland, which later promoted him to be its Medical Commissioner. He had been chairman of the Irish Public Health Council, of the Central Midwives Board for Ireland, and of the General Nursing Council for Ireland, and was the author of a report to the Carnegie United Kingdom Trust on the physical welfare of mothers and children in Ireland. His knighthood, in recognition of long and valuable public service, was announced in the New Year's Honours List of 1921, and from 1925 to 1936 he was a Senator of the Irish Free State. He had been a member of the British Medical Association since 1892.



Sir Edward Coey Bigger married in 1886 the daughter of Dr. William Warwick of Belfast; she died in 1926. His son, Dr. J. W. Bigger, is professor of bacteriology and preventive medicine in Dublin University and Dean of the School of Physic, Trinity College, Dublin; he was honorary local general secretary for the successful Annual Meeting of the B.M.A. held in Dublin in 1933.

[The photograph reproduced is by the Press Portrait Bureau.]

WILFRID KENT HUGHES, M.B., F.R.A.C.S.

The Australian papers announced recently the death of Wilfrid Kent Hughes, a well-known Melbourne surgeon, who carried on his work in two different specialties—orthopaedics, and diseases of the ear, nose, and throat—"below the knee and above the neck," as he was accustomed to phrase it.

Hughes, the son of a grazier, was born in Victoria in 1865. He won an entrance scholarship to Melbourne Grammar School, went on to the University of Melbourne, then came to England and studied at St. Bartholomew's, graduating in 1892 M.B.Lond. Returning to Victoria, he started practice in Collins Street, Melbourne, in premises which he occupied for the rest of his professional life. For about 30 years he served the Royal Melbourne Hospital in the department for diseases of the ear, nose, and throat, and for a like period the orthopaedics department of the Children's Hospital. During the last war he enlisted with the Australian A.M.C., and saw service at Gallipoli. He returned invalided to Australia at the end of 1916, but in the following year sailed again for the scene of hostilities, and went to Petrograd with the British-American Hospital. Owing to the revolution, with consequent lack of supplies, the hospital had to close down, and Hughes made his way home through Siberia, arriving in Australia after having suffered severe privations which affected his health for the rest of his life.

He joined the B.M.A. in 1907, and took an active part in the affairs of the Victorian Branch. For 15 years he was a member of the directorate controlling the *Medical Journal of Australia*. He was a familiar figure at many Australasian congresses, and at one of them held at Dunedin in 1927 he was vice-president of the Section of Orthopaedics. In public work he was prominent as a member of the Melbourne City Council for some years; he twice unsuccessfully endeavoured to enter the State Parliament. A man of great zest in discussions, professionally most keen, and with sterling qualities of courage, sincerity, and loyalty, he was highly esteemed by his colleagues.

Dr. Hughes was married three times. His first wife was Miss C. Rankin, whom he met at St. Bartholomew's when a student, and who assisted him with translation work for a book on orthopaedics, of which he was joint author. He had ten children, all of whom are living, and two of them—a daughter and a son—are members of the medical profession. Six of the ten are graduates of the University of Melbourne.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

At a Congregation held on June 5 a Grace was approved for the conferment of the degree of M.A., *honoris causa*, upon Sir S. Rickard Christophers, M.B., F.R.S., who has been engaged for several years in research at the Subdepartment of Entomology. It was also resolved to substitute, after the present term, Tuesday for Monday in three places in the regulation for the dates of the First M.B. Examination.

Titles of the degrees of M.B., B.Chir. have been conferred on E. Rhodes of Girton College.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW

At a meeting held on June 1 the President, Mr. Roy F. Young, intimated the receipt of a legacy of £200 from the estate of the late Dr. A. Brown Kelly.

The following were admitted Fellows of Faculty: Alexander Cameron Ewing, William Gray, James Jarvie, Liselotte Lenghoff, John Leslie Markson, David Stenhouse.

SOCIETY OF APOTHECARIES OF LONDON

The following candidate has satisfied the examiners at the examination indicated:

MASTERY OF MIDWIFERY.—Ellen M. T. Colls.

The following candidates have passed in the subjects indicated:

SURGERY.—P. L. McN. Armstrong, R. S. Gunewardena, L. D. Miller, W. C. Salter.

MEDICINE, PATHOLOGY, AND FORENSIC MEDICINE.—L. D. Miller, N. F. Murphy, C. J. O. Taylor, J. J. Wild.

MIDWIFERY.—G. R. S. Jackson, D. S. Jones, F. A. Rutland, R. M. B. Talbot.

The diploma of the society has been granted to L. D. Miller, N. F. Murphy, C. J. O. Taylor, and J. J. Wild.

The Services

CASUALTIES IN THE MEDICAL SERVICES

Lieut. STEWART STANLEY MAIR, R.A.M.C., who is included as "Died" in an Army Council Casualty List published on May 30, was born on June 4, 1916, and was educated at the University of Glasgow, where he graduated M.B., Ch.B. in 1939. He entered the R.A.M.C. as temp. lieut. in March, 1941.

Missing.—Surg. Lieut. G. S. Cross, R.N.V.R., Temp. Surg. Lieut. W. J. Winthrope, R.C.N.V.R., Capt. R. G. B. Young, R.A.M.C.

DEATHS IN THE SERVICES

Lieut.-Col. JOHN MACFARLANE CADELL, I.M.S. (ret.), died at Kirkliston, Linlithgow, on May 3, aged 80. He was born on March 8, 1862, the son of Henry Cadell, D.L., and was educated at the University of Edinburgh, where he graduated M.B., C.M. in 1884. After studying at Vienna he entered the I.M.S. as surgeon in 1885, became lieut.-col. after twenty years' service, and retired in 1913. He served in Burma in 1886–9, with the 4th Brigade at Mogaung (medal with two clasps); on the North-West Frontier in the Hazara campaign of 1891 (clasp); and in Tirah, 1897–8 (medal with two clasps). In 1914 he rejoined for service as a major in the R.A.M.C.(T.A.), and served with the Royal Scots from October, 1914, to February, 1922, and was a member of the Egyptian Expeditionary Force in 1915–16. Most of his service in India, when not on military duty, was passed in civil employ in the United Provinces.

Medical Notes in Parliament

Medical Man-power Report

Mr. ERNEST BROWN told Major Haden Guest on June 4 that it would not be in the public interest to publish in full the report of the committee dealing with the allocation of medical personnel between the Services, the E.M.S., and the civilian population. He would consider whether an abridged version could usefully be prepared and published. He had taken this decision after consulting the Secretary of State for Scotland and the Service Ministers.

Contraceptives for the Army.—Asked by Mr. Hannah why official sanction had been given for the use of contraceptives in the Army, and if he would reconsider his attitude in this matter, Sir JAMES GRIGG said that in the British Army, as in other armies, facilities were provided whereby soldiers who wished to do so might obtain preventives against venereal disease. He did not propose to withdraw these facilities.

Women Medical Students.—Mr. DOUGLAS inquired on June 4 whether the Minister of Health would, in connexion with any reorganization of the hospital system, give consideration to securing the admission of women students into all medical schools on equal terms with men. Mr. ERNEST BROWN answered that he would bring the suggestion to the notice of the committee which was considering the organization of medical schools.

Milk Distribution.—Major LLOYD GEORGE announced on June 3 that to ensure that milk would be available to meet the requirements of the National Milk Scheme, changes in the marketing of milk had been decided on. Measures would be taken to rationalize the collection and transport of milk and for the rationalization of retail distribution. A scheme of testing the keeping quality of milk would be introduced forthwith. Replying to Dr. Summerskill, who asked whether the Minister would insist on the milk being pasteurized, Major Lloyd George said the White Paper on the Government's milk policy would show what was proposed. In a reply on June 4 to Major Haden Guest, Mr. E. Brown said persons suffering from active tuberculosis, whether in hospital or not, were entitled to priority supplies of milk. The term "active" was taken as meaning "unhealed," and covered cases with artificial pneumothorax in which the disease was considered to be unhealed.

EPIDEMIOLOGICAL NOTES

Discussion of Table

In *England and Wales* a slight increase in the notifications of scarlet fever and diphtheria, and a further large rise in the incidence of measles, were recorded; the number of cases of whooping-cough declined. There were 20 fewer cases of cerebrospinal fever than in the preceding week, and 12 more cases of dysentery. The very low combined total for paratyphoid and typhoid fever—8 cases—recorded during the week was seldom reached in pre-war days.

Notifications of measles were 826 more than in the preceding week and 50% more than four weeks earlier. The largest rises in incidence occurred in London, Surrey, Kent, and Southampton, with increases of 105, 134, 114, and 103. Measles is prevalent in relatively few counties, mostly in the large urban areas. Half of the total notifications were contributed by four counties: London 761 cases (Wandsworth 121, Woolwich 152); Middlesex 770 cases (Harrow U.D. 108); Lancashire 1,300 cases (Liverpool C.B. 251, Manchester C.B. 373); Warwickshire 403 cases (Birmingham C.B. 324). At the other end of the scale the six counties of Wiltshire, Devon, Cornwall, Somerset, Suffolk, and Lincoln contributed only 20 cases between them.

Although 150 fewer cases of whooping-cough were recorded, the only area to show a marked decline was London, with 66 cases fewer than in the previous week.

The increase of 12 in the total for dysentery was due to small outbreaks in Hampshire, Kinsclere and Whitchurch R.D. 9 cases; Oxfordshire, Bullingdon R.D. 7 cases; Northamptonshire, Wellingborough U.D. 7 cases. A further 14 cases were reported from Surrey, Epsom and Ewell M.B.

In *Scotland* the incidence of infectious diseases declined, with the exception of scarlet fever and measles. The returns for measles were dominated by the experience of Glasgow, where there were 490 cases, an increase of 42, as compared with a rise of 28 for the whole country.

In *Northern Ireland* the epidemic of measles in Belfast showed a further rise, 44 more cases being recorded than in the preceding week.

Returns for the Week Ending May 30

The infectious diseases notified during the week in England and Wales included the following: scarlet fever 1,091, whooping-cough 1,103, diphtheria 636, measles 7,195, acute pneumonia 861, cerebrospinal fever 146, dysentery 110, paratyphoid 5, typhoid 4.

No. 20

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 23.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1942 (a)	(b)	(c)	(d)	(e)	1941 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	158	8	40	4	10	284	15	55	2	12
Deaths		1	1				5	6		
Diphtheria	653	40	171	46	19	926	38	191	41	41
Deaths	13	—	1	3	—	25	3	6	—	2
Dysentery	97	6	41		—	77	9	43		—
Deaths		—	—	—	—			—	—	—
Encephalitis lethargica, acute	1	—	—		—	2	—	2		—
Deaths		—	—				—	—		
Enteric (typhoid and paratyphoid) fever						34	4	31	6	—
Deaths						—	—	—	—	—
Erysipelas			42	5	2			50	7	4
Deaths			—				—	—		
Infective enteritis or diarrhoea under 2 years				54						
Deaths	40	6	6	9	—	36	5	8	8	7
Measles	6,437	761	590	115	331	11,909	341	151		4
Deaths	10	—	6	1	—	17	—	1	—	—
Ophthalmia neonatorum	89	2	34		1	80	4	17		2
Deaths										
Paratyphoid fever	3		6							
Deaths	—		—		—					
Pneumonia, influenzal*	1,137	50	16	2	14	1,067	44	11	7	2
Deaths (from influenza)	14	—	4	1	1	21	2	4	3	6
Pneumonia, primary			307	24				290	15	
Deaths		—		14	12		—		15	—
Polio-encephalitis, acute	2	—				1	—			
Deaths		—					—			
Poliomyelitis, acute	4	—	1	—	—	2	—	—	1	—
Deaths		—	—				—	—		
Puerperal fever	—	4	11	2	1	—	—	8	3	—
Deaths		—					—			
Puerperal pyrexia	187	8	15		1	126	10	11		—
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,122	45	177	51	14	1,153	45	152	48	23
Deaths	—	—	—	—	—	—	—	2	—	
Small-pox	—	—	—		—	—	—	—		—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhoid fever	5	—		4	1					
Deaths	1	—	—	—	—					
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough	1,267	137	63	64	18	4,086	143	521		4
Deaths	13	2	3	—	—	27	2	17	2	1
Deaths (0–1 year)	329	37	65	41	1	405	37	71	36	20
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,434	619	664	229	132	7,285	1,665	692	233	221
Annual death rate (per 1,000 persons living)			14·9	15·3	†			15·1	15·5	19·4
Live births	6,140	705	904	459	307	5,216	416	927	313	209
Annual rate per 1,000 persons living			18·7	30·6	†			18·9	20·8	18·3
Stillbirths	237	22	43			219	18	46		
Rate per 1,000 total births (including stillborn)			45					47		

* Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

† Owing to evacuation schemes and other movements of population, birth and death rates for Northern Ireland are no longer available.

Medical News

A week-end course for medical practitioners on factory medical services and industrial diseases will be held at the London School of Hygiene on June 27 and 28. The proceedings will be opened by Sir David Munro, Chief Medical Officer, Ministry of Supply, at 2 p.m. on June 27; at 2.15 p.m. Mr. R. R. Hyde will speak on "The Development of Health and Welfare Services in Industry"; and at 4.15 p.m. Mr. W. Gissane will give an address on "The Scope of the Industrial Medical Officer in the Rehabilitation of the Injured Workman." The programme for June 28 is as follows: 10.15 a.m., Dr. E. R. A. Merewether, "Dust and the Lungs"; 11.45 a.m., Miss May Smith, D.Sc., "Fatigue and Boredom in Industry"; 2.15 p.m., Dr. P. Pringle, "Treatment in the Works Ambulance Room"; 3.45 p.m., Dr. D. C. Norris, "The Effects of Physical Handicap on Working Capacity." The fee for the course is £1 1s. (plus 2s. 6d. if lunch is required), and applications should reach the secretary of the school (Keppel Street, London, W.C.1) by June 22.

A memorandum on "Hospital Treatment of Burns" is published in pamphlet form by H.M. Stationery Office for the Department of Health for Scotland. This marks the final stage of the task set by the Department to a committee of medical experts in Scotland. The first stage was the production of "The First-aid Treatment of Burns," a memorandum which reached a second edition soon after its original publication some months ago. The new memorandum deals with the subject in greater detail. Sir John Fraser, consultant adviser in surgery to the Department of Health, who was chairman of the committee, states in an introduction that a natural desire to explore alternative methods of treatment and to comment on the results has created a position which is confusing to the general reader. Among such a variety of methods of treatment, each so ably presented and sponsored, the general reader finds it difficult to make a choice when faced with the practical issue. A "community" opinion is likely to be welcomed under such circumstances, and it was reasoning of this kind which induced the Department of Health to appoint the committee. The memorandum is on sale at 9d. a copy.

The issue of the *Journal of the American Medical Association* for March 28, which is a hospital number, contains an article by Surgeon-General Thomas Parran on wartime problems of the public health service.

The issue of the *Schweizerische Medizinische Wochenschrift* for February 14 is dedicated to the co-editor, Dr. Eugen Bircher, on the occasion of his sixtieth birthday.

The Greek Medical Association has requested the ecclesiastical authorities to allow cremation in the case of members of the Greek Orthodox Church, for hygienic reasons and also owing to the scarcity of wood for coffins.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1.

ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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QUERIES AND ANSWERS

Effects of Mustard Gas on the Skin

"J. L." inquires whether solutions of hypochlorous acid would prove effective and convenient applications to counteract the effects of mustard gas on the skin.

*** After full consultation with their experts, the Ministry of Health and the Ministry of Home Security have recommended the use of Anti-gas Ointment No. 2 to counteract the effect of liquid mustard gas on the skin. If no ointment is immediately available and one happens to be near a chemist's shop then the Bleach Cream provided there should be used. This local treatment of the contaminated skin should be followed as soon as possible by a good wash down of the entire body with soap and water (preferably warm water) in your own or in your neighbour's home. A Ministry of Health leaflet entitled "If Hitler uses Blister Gas" deals with this point. It has been very recently circulated to all concerned in the more vulnerable areas. Many proprietary preparations have been tested but have proved less effective than the treatment recommended above, which is the considered view of both Ministries.

Sharpening Scalpels, etc.

Dr. W. REGINALD WILSON (Doncaster) writes in reply to P. K.: Quite good results can be obtained with an ordinary carpenter's oilstone or hone. First see that it is free of old oil and grease by wiping with ether or spirit, and put new thin (bicycle) oil on. If the edge of the scalpel is very thick, jagged, or turned, the cure will involve a lot of work, and it had probably better be sent to the professional grinders. Otherwise lay the blade almost flat on the stone and move it along with the edge in advance, and the heel of the blade 45 degrees or so in advance of the point. Contact must always be light, and at each stroke it should begin at the base and finish at the very point. Test the cutting edge from time to time on a piece of cotton-wool, and when it shows any sign of getting sharp take only single strokes each way. Turn the scalpel over on its back, not on its edge, or you will spoil your work. Straight scissors also can be sharpened on a flat stone, if applied with care at the proper angle. This should be just less than 90 degrees from the flat face which makes contact with the other blade. Take nothing off this latter except odd accidental unevenness—most important. For hypodermic needles, scissors curved on the flat, and Syme blades, a convex cylindrical surfaced stone is needed. Many needles are very soft, and sharpening may easily be overdone. Examine with a lens if in doubt, and take care to preserve the original shape of the point. Lay on the stone at right angles to the long axis of the stone, and rub the point crosswise with short strokes.

LETTERS, NOTES, ETC.

Scabies

The Ministry of Health has reason to believe that observations on scabies made by medical practitioners in this country are not always made available to the profession from causes connected with the paper shortage, the hesitation of practitioners to publish isolated observations, or the difficulty in finding time for recording such observations. In view, however, of the importance of this disease, especially in wartime, the Ministry will be grateful for any such information, the value of which may be greater than is apparent to the observer. Communications should be addressed to the Deputy Chief Medical Officer, Ministry of Health, Whitehall, S.W.1.

Truby King Babies

Dr. BERNARD SPENCER writes: Your correspondent Dr. A. G. Watkins asks (April 4, p. 454), "What is a Truby King baby?" As the father of four Truby King babies I may perhaps throw some light on the mystery. The artificially fed type is a baby fed on the closest practicable approximation to natural breast milk. My eldest child was breast-fed on Truby King principles, and is generally considered a thoroughly sound specimen of boyhood. His triplet sisters were artificially fed from birth by Truby King methods. In spite of the fact that they were considerably under weight at birth (3 lb. 8 oz., 3 lb. 9 oz., 4 lb. 5 oz.) they compare very favourably with any healthy child of their own age. During their first 9 years they had no illness whatsoever, even evading scarlet fever, to which my wife and I fell victims when they were 2½. At 9 they demonstrated how easily an attack of mumps can be dealt with, for beyond the parotid enlargement there was no evidence of illness or even malaise to be detected. For purposes of comparison one of the girls may be set beside her brother, who is 20 months older than she. There is a very strong resemblance in physical type between the two; both are of a good colour, alert, strong, and active, and holding themselves exceptionally well. If either is a more athletic type than the other I would say the girl is the more so. I have compared these two because they are of similar physical type: the other two are equally healthy. All have perfect teeth. My wife performed all the work involved in feeding and supervising the four children after the triplets were 3 months old, at which age they left Cromwell House, Highgate. There was no "maternal dietetic anxiety," nor was there any "negativism." There was and still is considerable maternal anxiety as to what devilry will arise next.

Hazards of Transfusion: Corrigenda

We regret that three errors slipped into the summary of Brigadier Lionel Whitby's Harveian Lecture on "The Hazards of Transfusion," published last week at p. 698. The lecturer's first Christian name and rank were incorrectly given, and "Compton" tube should be "Kimpton" tube.